PAPER TRADE JOURNAL

VOL. 123, NO. 22 NOVEMBER 28, 1946

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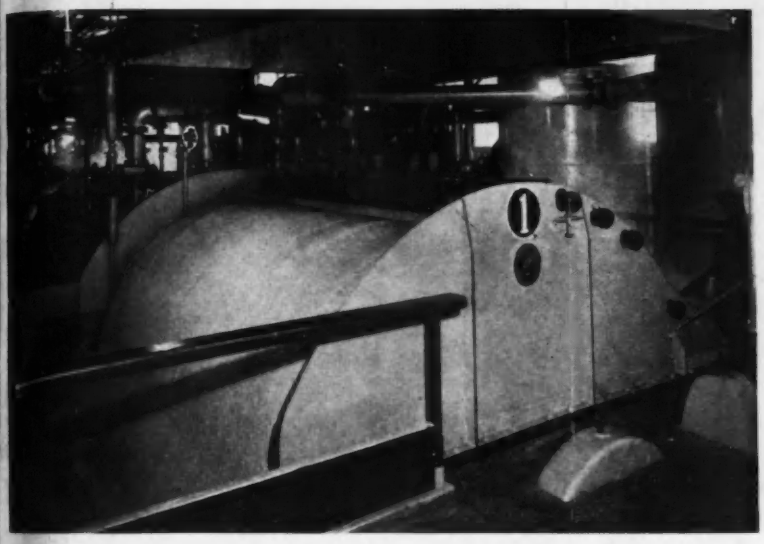

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sconsin Mills Examine Proposed Curbs on Cutting
Hobson Named Head of St. Croix Paper Co.
ngress Asks Bids on Paper Requirements
ebec Premier Bars New Pulp Mills

Midwest Waste Prices Reflect Decontrol Confusion
Coal Strike Threatens Hudson Valley Output
Allen Proposes Cut in GPO Paper Need
Canton Mill Election Rejects AFL

Over 200 Suction Felt Rolls

Used on Paper and Board Machines

Installations of Downingtown Suction Felt Rolls at various positions on Fourdrinier and Cylinder Machines show 20% to 100% increase in felt life, depending on the condition of the machine parts and the class of stock being handled. These rolls continuously keep the full width of the felt clean and open at all times. Photo below shows an installation on a fourdrinier making book.

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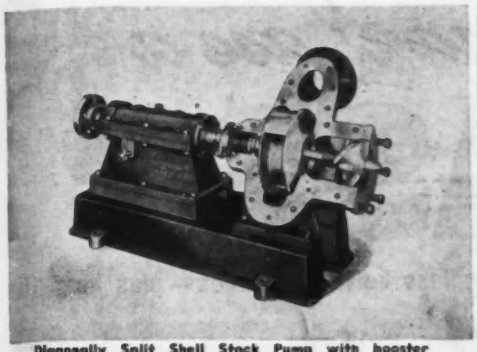
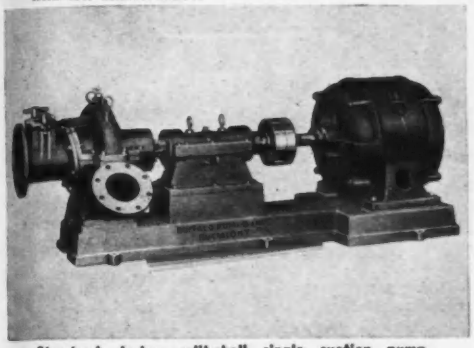
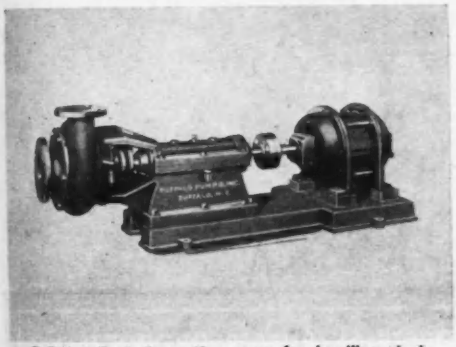


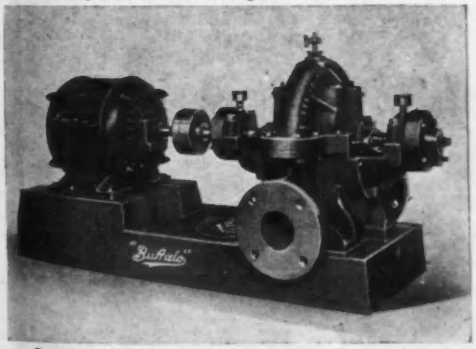
Diagonally Split Shell Stock Pump with booster impeller on inlet . . . for high consistency stock with low submergence.



Standard design split-shell single suction pump, ideal for stock jobs with a "high head".



Solid shell single suction pump for handling stock up to 5% consistency, and clay, caustic, other slurries, milk of lime and general service.



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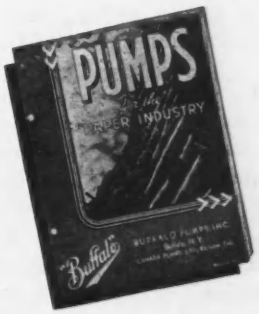
"Buffalo" has designed such pumps for many years for the paper and pulp industries . . . pumps that stay on the job and keep delivering up to rated capacity.

For maintenance savings and real pumping efficiency, why not look into the wide range of types and capacities offered in the "Buffalo" line? Your "Buffalo" representative will be glad to advise you.

CHOOSE THE RIGHT PUMP from this complete bulletin describing "Buffalo" Paper Pumps. Simply write for Bulletin 953-F.



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On such drives you merely specify roll-lot COMPASS belting, cut to length; have your distributor apply it with Goodyear's patented vulcanized splice — and your troubles are over, as the following case history proves:

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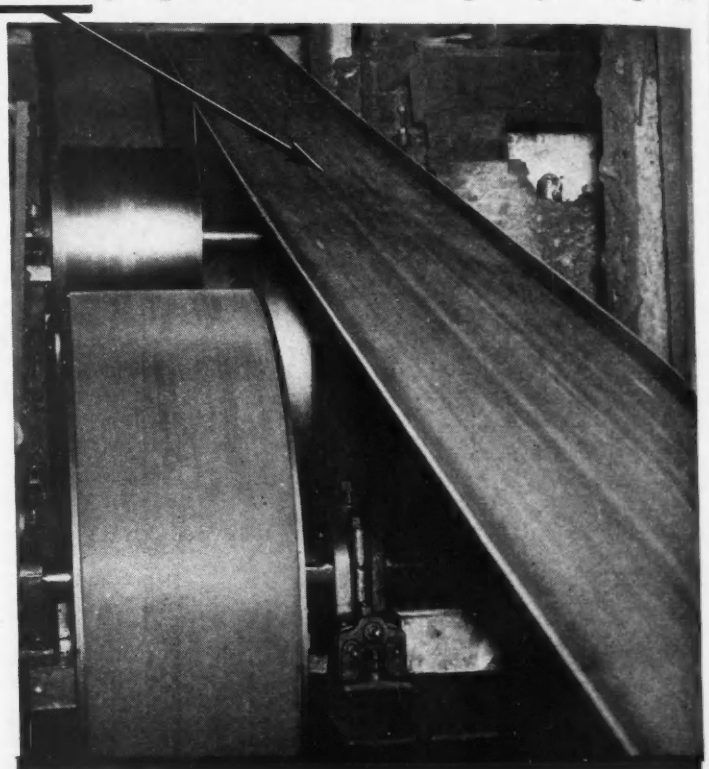
A big eastern paper mill was having trouble with its cross-compounded, dual, main drive, powered by a steam engine normally developing 550 to 600 HP but hitting up to 850 HP under peak conditions. To handle this load the G.T.M. — Goodyear Technical Man—recommended a COMPASS 51 Belt on one drive and a COMPASS 101 on the other — both spliced endless on the job.

The COMPASS 51 performed for six years without slip and with negligible stretch before it was damaged by accident and had to be replaced with another COMPASS. The COMPASS 101 ran 19 months longer before it failed due to an excessive oil condition, rather than to any fault in the belt.

Such performance on an extremely heavy-duty drive typifies the extra service and dependability you can expect from cut-length, roll-lot COMPASS belting on all types of drives. Order from the G.T.M. — or your nearest Goodyear Industrial Rubber Products Distributor, local headquarters for hose, belting, molded goods, packing and tank lining built to the world's highest standard of quality.



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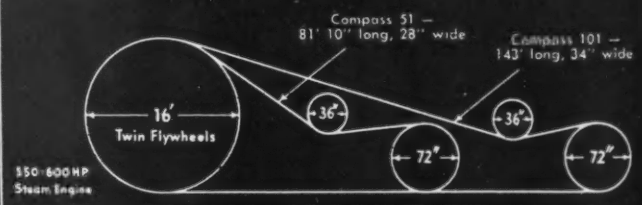
vulcanized endless for paper mill main drive



GOODYEAR

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PAPER TRADE JOURNAL
Vol. 123, No. 22 November 28, 1946
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Congress Asks Bids On Paper for GPO

WASHINGTON—Sealed proposals will be received until 10 a.m., December 16, in the room of the Joint Committee on Printing, in the Capitol, for furnishing the paper for the public printing and binding, and blank paper for the use of the Government departments and establishments in the District of Columbia, for the term of three months, beginning January 1, 1946; deliveries to be f.o.b. Government Printing Office Warehouse, or warehouse siding, Washington, D. C. The proposals will be opened in the presence of and the award of contracts made by the Joint Committee on Printing to the lowest and best bidders for the interest of the Government whose bids are in conformity with the requirements of the proposal. The Committee reserves the right to reject any or all bids, or to accept any bid or any part and reject the other part, if, in its opinion, such action would be in the interest of the Government.

Blank, proposals containing the instructions, schedule, and specifications, accompanied by standard samples, may be obtained by addressing A. E. Giegenback, Public Printer, Washington 25, D. C.

Contracts will be entered into for supplying the quantities required, whether more or less than the estimates, as provided in paragraph 15 of the instructions.

The approximate estimated quantities set forth in detail in the schedule comprise:

3,600,000 pounds newsprint paper.
200,000 pounds catalog news paper.
1,150,000 pounds machine-finish book paper.
100,000 pounds English-finish book paper.
1,400,000 pounds offset book paper.
350,000 pounds offset poster paper.
200,000 pounds antique book paper.
50,000 pounds 50% lightweight machine-finish book paper.
50,000 pounds 50% antique book paper.
900,000 pounds supercalendered book paper.
650,000 pounds coated book paper.
550,000 pounds mimeograph paper.
140,000 pounds duplicator copy paper.
150,000 pounds U S M O safety writing paper.
8,090,000 pounds writing paper.
50,000 pounds map paper.
330,000 pounds manifold paper.
2,250,000 pounds bond paper.
775,000 pounds ledger paper.
1,150,000 pounds index paper.
150,000 pounds cover paper.
130,000 pounds manila paper.
400,000 pounds kraft paper.
25,000 pounds blotting paper.
5,000 pounds high-finish red sulphite paper.
130,000 pounds tag board.
50,000 pounds manila board.
65,000 sheets railroad board.
220,000 pounds wood cardboard.
40,000 pounds, chemical wood tan board.
4,450,000 pounds postal card paper.
150,000 pounds newsboard.
120,000 pounds binder's board.

In cases where more than 1,000 reams are called for, proposals will be received for 1,000 reams or more.

Quebec to Bar New Pulp Mills

MONTREAL—No new pulp and paper mills in Quebec appears to have emerged as a definite policy of the Provincial Government. In an address at Gatineau last week, Premier Duplessis is reported as saying that no more newsprint or pulp mills will be allowed, with the possible exception of one at Chicoutimi.

Later this week, official government sources indicated that the Premier's statement did not exclude the reopening of the St. Maurice Paper Mill at Cap de la Madeleine, and possibly one other mill, not named.

John Hobson Heads St. Croix Paper Company

BOSTON—John L. Hobson, vice-president and treasurer of the St. Croix Paper Co., has been named president of the company to succeed his father, the late Arthur L. Hobson. Mr. Hobson joined the company, which has a Boston office at 15 State Street, in September, 1919, after serving overseas in the first World War as a second lieutenant in the 26th Division. In 1929, he was made treasurer and in 1938 was appointed vice-president, still retaining the treasurer's position.

Wisconsin Mills Examine Proposed Curb on Cutting

GREEN BAY—Wisconsin's paper and pulp industry favors public controls to prevent the cutting of immature wood on the millions of acres of cut-over lands now growing a second crop of forest. This was made plain at four hearings conducted last week in the state by the Wisconsin Conservation Commission, the last of them in this city Thursday, November 21. The others were held at Hayward, Wisconsin Rapids and Rhinelander.

Some opposition, primarily by private landowners, was manifested. It was based mainly upon a reluctance to sanction further governmental interference in private affairs and an evident dread of bureaucratic rule. But the general sentiment was in favor of legislation, particularly in view of a warning that the federal government is planning restrictive legislation on forest cutting in those states which have not adopted restraints of their own.

The bill under consideration, expected to be submitted to the next session of the state legislature at Madison, is a revised version of one which met considerable objection two years ago. It would provide for the creation of an advisory committee to the Conservation commission to promulgate rules for the harvesting of pulpwood and timber in the state. The committee would include landowners and representatives of the various wood-using industries.

Folke Becker, president of the Rhinelander Paper Company, said at the Rhinelander hearing that Wisconsin pulp and paper manufacturers are unanimous in the opinion that drastic action is needed to protect Wisconsin wood resources for the benefit of the wood-using industries in the future. He pointed out that "it is rather late now," but that forestry requires looking ahead for many years.

Mr. Becker said that the Wisconsin pulp and paper industry, which is one of the largest in the state, would have grown larger and more prosperous had a supply of native raw materials been secured. He explained that some of the largest paper manufacturers are now building plants in Canada because of the scarcity of raw materials.

(Continued on page 22)

Canada Still Argues Forestry Practise

TORONTO, Ont.—Evidence so far submitted to the royal commission appointed by the Ontario government to enquire into forestry resources would indicate that there is considerable feeling among those interested in the best use of the province's bushlands that present arrangements with large operators, both in the lumber and pulp and paper industries, are unsatisfactory. There is more than a suspicion that some of the deals made in the past by government representatives, with companies operating on a large scale, have, at least, not been to the best advantage of the heritage of the people.

It is an old story, however, and one which succeeding governments over the last thirty years or more have been promising to remedy. Bitter political battles have been fought on the issue of whether or not the government of the day was administering the forest resources specifically in the interests of the people or the political party concerned. Ontario's present premier, George Drew, also made promises in his pre-election speeches a couple of years ago. The appointment of the royal commission, headed by Maj.-Gen. Howard Kennedy, is the first concrete evidence that the new premier intended to do anything about his promises. What he will do when the commission has made its report he deponeth not.

Since Premier Drew and Premier Duplessis of Quebec appear to think alike on at least some questions (anent disagreement with federal government re taxing powers) it may now be asked if Ontario's premier will think up something similar to Premier Duplessis and prohibit the establishment of any new pulp and paper mills in the province.

While the existing pulp and paper mills in Ontario, and those under construction, may possibly be sufficient for at least some time to come, it is felt here that prohibition of new developments is not the right answer to Ontario's forestry problems. Even the man on the street is well aware that "cultivation," rather than "mining" of our forestry resources, would be a great improvement. More extensive fire prevention facilities, a greater effort to control insect damage and more roads through the bushlands are other remedies generally agreed upon as being required. Then there is also the economic question, which has the habit of becoming a political question, concerning the export of sawlogs and pulpwood, as well as woodpulp. Its political chiefly because its a federal consideration and involves the country's economy.

Whatever changes, if any, Premier Drew may make in forestry regulations, the people of the province would seem to be justified in expecting that he will at least see to it that whatever contracts may have been entered into, between government representatives and bushland operators, will be adhered to, and that there will be no granting of privileges over and above the contract terms for whatever reason.

Coal Strike Threatens Hudson Valley Output

COHOES, N. Y. — The strike in the coal industry will have a severe effect on paper mills in this section. The Imperial Paper & Color Corporation has announced plans for closing its Plattsburg plant this week because of a shortage of bituminous coal. This will affect several hundred persons. Resumption of operations will depend upon outcome of the dispute. The mill at Glens Falls, employing about 1200 persons, has a sufficient supply to continue operations.

The Ancram Paper Mills in Columbia county are still closed pending settlement of labor trouble which affects about 135 persons. The efforts of the State Mediation Board to settle the matter have proved unsuccessful. The firm refuses to grant an hourly increase in wages of five cents.

A new wage agreement has been negotiated at the Warrensburg Pulp & Paper Company under which employes will receive an hourly increase in wages of ten cents, retroactive to November 1. The contract provides the workers with their highest salary since operations were started and also provides for insurance and hospitalization benefits.

Midwest Waste Prices Reflect Decontrol

CHICAGO—As the air clears a bit, it is noted locally that decontrol has resulted in higher prices in waste paper lines. Waste paper came in for fair trading, say reports, with revised mill buying prices listed with No. 1 mixed unchanged but with No. 1 news and No. 1 old corrugated up $5 and $1 a ton, respectively. Higher grades of waste paper have not been stabilized yet, says the local trade, but advances are anticipated with a possibility that a quotable basis may be available shortly. At this writing the basis was not yet in evidence.

Price increases in roofing rags were in evidence but there was some confusion and uncertainty about the going prices. However, the general guess was that roofing grades were up from 30 to 35 cents over the old maximums.

Country mixed rags were reported to be bringing about 3½ cents a pound f.o.b. Chicago. Some dealers were buying up roofing rags at these high prices, reports indicated, while sellers were still said to be holding back with the thought that there would soon be substantial revisions upward. Bag prices continued in a more or less unsettled state, said the local market, with things not yet sufficiently stabilized to "permit a quotation of firm prices."

Uong Urges World as Package Men's Goal

CHICAGO — D. D. Uong, Fitchburg, Mass., this week urged delegates to the Packaging Institute forum to strive for improved world trade as a tenet of world peace. Stressing the significance of scientific packaging as a guarantor of expanded trade, Mr. Uong said an inspection tour through the Orient revealed great varieties, raw materials and finished articles, fruits and vegetables "all of which could be brought to the American market safely, economically and in attractive form by the application of modern, scientific packaging."

Mr. Uong, a native of Foochow, China, whose studies and successful career in the United States have taken him to a vice-presidency of Fitchburg Paper Company, Fitchburg, Mass., and head of Fitchburg Overseas Corporation, particularly called attention to silk, tea, bristles, linen, wood oil and embroideries as oriental products in need of improved packaging facilities to speed their flow here.

"In exchange," he said, "tools, machinery, food, medicine, woolen goods and appliances can likewise be safely, economically and attractively packaged for the Chinese market." When trade, made possible by improved packaging, which made its greatest strides here during the war, "begins to flow between nations the world is bound to be peaceful and prosperous."

Sacandaga Assessments Laid on Paper Mills

COHOES, N. Y. — Among the firms assessed in Washington county for the maintenance and operation of the Sacandaga Reservoir are the United Paperboard Company, $1,108.40; Fort Miller Pulp & Paper Company, $683.40; Hudson River Power Corporation, International Paper Company, $251.60; Union Bag & Paper Power Corporation, Hudson Falls, $4,539; and Union Bag & Paper Power Corporation, Kingsbury, $1,180.65. Levies for the cost of building the reservoir are the United Paperboard Company, $7,476.22; Fort Miller Pulp & Paper Company, $4,609.57; Hudson River Power Company and International Paper Company, $1,697.06; Union Bag & Paper Power Corporation, at Hudson Falls, $30,615.82 and $7,963.56 in Kingsbury.

Savings Bank Elects Stevens Secretary

ALBANY, N. Y. — Winthrop P. Stevens, personnel director of F. C. Huyck & Sons, has been appointed secretary of the board of trustees at the National Savings Bank. He has served as a trustee since 1927. He is a veteran of both world wars and was graduated from Yale in 1920.

Allen Proposes Cut In Need for Paper

CHICAGO—A Congressman from Illinois, the veteran Leo Allen who is expected to assume the chairmanship of the powerful Rules Committee as the Republicans take over, bids fair to take some steps which will have a direct effect on the critical supply of paper in America. The Congressman reported this week that he is going to do his level best to "curb the bureaucrats when the eightieth Congress gets under way." He believes their rules are too many, too complex, too long and too frequent and says that "we have too long permitted the bureaucrats to issue regulations contrary to the intent of Congress." He stressed the growth of a "vast maze of executive decrees" and evidenced a quite obvious desire to trim them down.

Even as the Congressman was making his statement covering what Congress might do, the bureaus were learning, at first hand, that they would have to make some trimming simply because there wasn't enough paper to go around—on the present scale! It was learned here that from now on the bureaus would have to get along with "only" 28,000 tons quarterly for propaganda, press releases, directives and memoranda. With the Government running out of paper, even the War Department must get along with 4000 tons, says the report. Veterans Administration must cut down to 1000 tons, the Navy to 100 tons and Treasury Procurement to 1500 tons. Sources have reported that the action was taken "because although some paper mills have been selling as much as one-tenth of their monthly production to government agencies, other manufactures have been supplying little or no paper for government use."

Chicago paper trade executives are expecting that between the actual shortage and Congressman Allen's program there may be more paper for industry to use in getting the wheels in motion.

Union Bag Banquets Its Five-Year Men

HUDSON FALLS, N. Y.—Employes of the Union Bag & Paper Company affiliated with the firm for five years were tendered a recognition banquet during the past week by officials. Service awards were presented by the division superintendents and a social good time followed. The arrangements were under the direction of P. F. Marrs, general manager.

Dexter Hopes for Coal

WATERTOWN, N. Y.—The Dexter Sulphite Pulp and Paper Company is in a rather serious position as a result of the bituminous coal strike. The plant has only eight days' supply of coal. The company uses 100 tons of fuel per day. Plant representatives said that additional three days' supply is now on the rails, six carloads having been shipped from the mines.

Canadian Advertisers Elect Neil Powter

MONTREAL—Neil B. Powter, advertising manager for Howard Smith Paper Mills, Ltd., has been made president of the Association of Canadian Advertisers. He has been with Howard Smith Paper Mills since 1929 and lives in Montreal. Shortly after Harold Crabtree, Howard Smith president, was drafted into a wartime job to head up Allied War Supplies Corp., Mr. Powter was asked to overhaul the crown company's public relations set-up. Later he became public relations manager for the corporation and eventually official historian, without salary, on top of his regular job with Howard Smith.

Shirley Pleads for Small Woods Owners

SYRACUSE, N. Y.—Vigorous action is needed at once to start American forests on the uphill grade, according to an editorial by Dr. Hardy L. Shirley, which will appear in the Journal of Forestry for December. The Journal is the official publication of the Society of American Foresters. Dr. Shirley, who is editor of the Journal, is also assistant dean of The New York State College of Forestry at Syracuse University.

He states that the ambitious undertaking now being launched in New York through a new law which provides for free assistance by the State, may yield outstanding experience in working out the problem of the small woodland. There is more forest land in small ownership than in any other. These owners, more than large owners, need guidance and assistance in the management of their forests.

Dr. Shirley points out that, if information already accumulated and that which will be obtained in the application of state laws such as the New York law, is promptly and comprehensively studied and applied, it will make more certain the success of a National program.

Canton Workers Reject AFL Representation

CANTON, N. C.—According to announcement by officials of the National Labor Relations Board, employes of the Canton division of the Champion Fiber & Paper Company voted this week against representation by the International Brotherhood of Pulp, Sulphite and Paper Mill Workers (AFL). The vote was 119 votes for the union, 2,104 against.

NEPMA Stages Three Divisional Meets

BOSTON—Three important and timely local group meetings of the New England Paper Merchants Association were held last week.

Thirty-three fine paper member houses from the Eastern Massachusetts area gathered for a luncheon meeting November 18 at the Parker House, on notice of Paul M. Jones, Storrs & Bement Company, first vice-president for fine papers. Its speakers included J. Harry Londergan, director of Statistical Research Division, The National Paper Trade Association, New York, and E. Jay Huss, recently appointed NPTA industrial engineer to initiate and conduct studies and service to promote operating economy and efficiency in paper merchant warehouses.

Forty-four wrapping paper member houses from the Eastern Massachusetts area assembled November 19 for a luncheon meeting at the same hotel on notice of Walter G. Butler, Perkins & Butler, Inc., second vice-president of NEPMA, wrapping papers. Speakers included Willard G. Leathers, assistant secretary, The National Paper Trade Association; E. Jay Huss, and Floyd H. Blackman, member of executive committee, NPTA.

On the evening of November 19, thirty-one member houses, fine and wrapping, from the Rhode Island, Fall River, New Bedford and Worcester areas met at the Providence Biltmore Hotel for a dinner meeting on notice of James J. Dwyer, Stone & Forsyth Company, president of NEPMA. Speakers included Messrs. Leathers, Huss, Dwyer, Jones and Norman E. Scott, executive secretary, NEPMA.

A lively and constructive discussion period followed each meeting.

Further local meetings are to be held in December at New Haven, Hartford, Springfield, and at points in Vermont and Maine.

Blank Book Staff Signs For Group Insurance

HOLYOKE, Mass.—Ninety per cent of National Blank Book Co., employes who are eligible, are signing up for the new cooperative group insurance plan which the company is instigating, according to Treasurer Richard P. Towne.

Directors of National voted the plan recently and made it possible for all employes with one year or more of continuous service to obtain the protection. The company and the employe each pays one-half of the cost of the insurance.

The group insurance plan covers life insurance, accidental death and dismemberment, hospitalization, surgery, sickness and accident, and visiting nurse service.

Powell River Votes Extra Dividend

TORONTO—Directors of Powell River Company Limited, large Pacific coast paper producer, have declared a special dividend of 40 cents a share on the company's single-class capital stock, as well as a regular quarterly dividend of 30 cents a share. Both are payable, in Canadian funds, on December 14th to shareholders of record at the close of business November 26th.

Added to three quarterly dividends of 30 cents each previously paid, this declaration will bring total disbursements this year to $1.60 per share. Last year the dividends totalled $1.05 per share, the rate having been 25 cents quarterly for the first three quarters, increased to 30 cents quarterly for the final quarter.

The increase in dividend disbursements to $1.60 this year as against $1.05 in 1945, suggests that the company's earnings will make a favorable comparison when the report for 1946 is issued, probably some time next April. Last year the retainable net earnings equalled $1.51 per share on 1,344,695 shares outstanding.

It may be recalled that in February of last year an offering of 300,000 shares of the company's stock was made to the public. This did not represent new financing, but consisted of stock purchased from shareholders and reoffered to the public. By that step the company's stock became available for investment by the public, as the company had previously been a family-owned private concern.

The shares are listed on the Montreal and Toronto stock exchanges. They have ranged this year between 28 and 36 and are currently selling around 34. At this price a yield of nearly 4¾ per cent is indicated on the basis of disbursement of $1.60 per annum.

New Fire-Fighting Weapon Puts Out Blaze in Seconds

BROOKLYN, N. Y.—Newest development in fire-fighting efficiency is the Underwriters-approved, stored-pressure hand extinguisher manufactured by Union Stop-Fire Corporation.

In Stop-Fire carbon dioxide is combined with carbon tetrachloride to produce a chemical of extraordinary effectiveness in putting out fires.

Shot as a fine spray, this chemical is converted instantaneously into a heavy, fire-smothering gas. Even fires of the most stubborn kind—oil, ether, gasoline, electrical—are blanketed and snuffed out in a matter of seconds.

The Stop-Fire extinguisher has a long range, the bulk of the stream traveling anywhere from 15 to 25 feet.

The fluid is said to be effective indefinitely, and the Stop-Fire tank does not have to be refilled, except when used. A pressure gage attached to the extinguisher indicates fluid pressure at all times.

Blaw-Knox Grapple Handles Small Wood

PITTSBURGH—A step in a new effort to increase the supply of pulp for paper production, a Blaw-Knox pulpwood grapple transfers small wood directly from delivery cars to the working floor. Economical recovery of small timber from the logged-off lands of the Far West is a new development that permits increasing the production of pulp, while conserving timber.

Mechanical grapples are among the tools which have made clean logging a practical measure. Through their use in the woods and at loading points, through the use of portable sawing mills, combined rail and motor vehicle transport, and newly developed small-wood hydraulic barkers, it is now possible to salvage timber formerly wasted.

The new techniques are calculated to save 20 per cent in wood usage. This will amount to about 40 million feet annually—a small forest saved for future use. Clean logging also contributes to ease of re-forestation.

St. Regis Machine Men Confer at Oswego

OSWEGO, N. Y.—Field representatives of the machine division of the St. Regis Paper company from all parts of the United States and Canada last week held a two-day meeting in this city, with H. S. Hangan, New York, general field manager, in charge.

The group, numbering 45, had luncheon at the Hotel Pontiac at 1 o'clock Tuesday afternoon. Executives and employes in the engineering department of the Oswego plant also were present at the conference and luncheon of the field managers.

Developments in bag filling machines and other equipment produced at the plant, together with the program of the machine division of the company for the coming year were discussed.

Morris Mills Financing Is Offered by Syndicate

NEW YORK—Hallgarten & Company and associates today offered 29,192 shares of 4¾ per cent preferred stock and 54,486 common shares of Morris Paper Mills. The preferred was priced at its par value of $50 a share and the common at $18 a share. Distribution is being made for the account of certain stockholders.

Other members of the underwriting group are: Hornblower & Weeks; Shields & Co.; Bacon, Whipple & Co.; Bear, Stearns & Co.; Graham, Parsons & Co.; Farwell, Chapman & Co.; Kebbon, McCormick & Co.; J. M. Dain & Co.; First California Company; Kalman & Co., Inc.; Piper Jaffray & Hopwood; Ames, Emerich & Co. and Braisford & Co.

Dramatizes the Role Of Air Compressors

HOLYOKE, Mass.—The importance of compressors from an industrial, economic and social standpoint was stressed by E. J. Schwanhausser, vice-president in charge of sales and a director of the Worthington Pump and Machinery Corp., speaking at a dinner meeting of the Engineering Society of Western Massachusetts in the Hotel Roger Smith this week. The compressors manufactured here play a large part in everyday life, said Mr. Schwanhausser, who told that the mining, petroleum and automobile industries couldn't exist today without refrigeration air or gas compressors.

"Economically, compressors may prove to be a throttle valve on the price of coal in the near future," the speaker said. He said this would be accomplished by converting the Big and Little Inch pipe lines to gas carriers, which would have compressors as motivating forces. With these lines in operation, a competitive field would be setup with the coal and railroad industries by bringing natural gas from the Southern fields up to New York and New England. He said this possible threat is having its effect on negotiations in the pending coal strike.

Summing up the situation now confronting the country, Mr. Schwanhausser said: "We have enormous facilities, tremendous markets, and unless we put aside our differences and cooperate, we will be like the little girl who went to a party only to find that it had been held the day before."

Prior to the banquet, which was attended by 125, a group of 75 members of the Engineering Society were conducted through the Holyoke works of the Worthington by H. J. Schorle and his assistants. Considerable interest was shown in the complete line of postwar products which Worthington is now putting on the market. Among the products displayed were a complete new line of refrigeration equipment, air compressors, air conditioning equipment and pneumatic tools. The extent of Worthington's venture into research was explained by F. G. Riedel, director of research. All facilities of the laboratories were in operation, demonstrating the achievements of electronic instruments.

The afternoon and evening program was arranged by A. C. Nolder, member of the program and meetings committee of the local plant, while A. N. Clifton of Springfield, president of the Engineering Society, presided at the dinner.

Howard Witt Composes Community Chest Songs

PHILADELPHIA—Songs composed by Howard W. Witt, an executive of the Scott Paper Company, Chester, and a worker in the campaign, are helping to liven meetings of the local Community Chest Drive.

The BROUGHTON
S-10-H OSCILLATING SHOWER

for

Cylinder Moulds, Thickeners, Felts, Wire and Vats

equipped with

NEW HYDRAULIC OSCILLATION

Pat. November 3, 1942—2300909
(Other Patents Applied For)

We are also manufacturers of S-13-H Showers for cleaning head box cylindrical screens.

The same water drives the oscillator that passes through the shower. No grease or oil. Everything water lubricated. Compact and easily installed.

Requires less than 7 gallons per minute of FRESH FILTERED water per 100" of wire to do a thorough job of continuous cleaning.

Savings on cylinder machines in excess of 200,000 gallons each 24 hours.

Can be equipped with non-oscillating adjustable deckle edge jets.

Same shower can be applied to any position where a shower is necessary.

Bulletin upon request

A. E. BROUGHTON & COMPANY

Manufacturers of Oscillating Showers, and Unit Vacuum Controls for paper machine suction boxes.

GLENS FALLS, N. Y.

Technical Men Plan Montreal Program

MONTREAL—The 1947 Annual Meeting of the Technical Section, Canadian Pulp and Paper Association, will be held at the Mount Royal Hotel on January 29th, 30th and 31st. Program details which are fairly definitely settled at this time include papers on slime control, newsprint quality, control of moisture in newsprint manufacture, uses for kraft pulp, alkaline pulping research, tallol, brown stock refining, a modern sulphite layout, sulphite acid plant operation. Two papers on sulphite bleaching, electric motors in the pulp and paper industry, the amplidyne paper machine drive, fluid drives, the Carlsson printing test, the Chapman smoothness tester, physics of water removal, instrumentation studies and the use of British disintegrator for evaluating pulp.

The sulphite committee plans a session on the pulping of various woods, with informal papers and discussion. The alkaline pulping committee will discuss the manufacture of kraft papers and consider problems of alkaline pulp mill maintenance. The heat and power committee will devote a session on back tender ropes and dryer felt life. The board committee has assigned a period to dry end operation. The fundamental research program at the Pulp and Paper Research Institute of Canada has been chosen for the group discussion topic at the wood chemistry meeting.

Further formal papers are planned on the following subjects: Drying of paperboard, board manufacture in Scandinavia, the Stapley pulper, stock refining, longitudinal grinding, study of burr penetration, the grinding of jack pine and the bleaching of groundwood.

The sulphite committee has allotted a session to the operation of indirect heating systems and the newsprint committee plans to discuss the double suction couch and slime control in newsprint mills. The engineering committee has chosen to discuss the layout for an ideal groundwood mill. The heat and power committee, at a second session, will consider infra-red and high frequency drying. The waste committee will discuss its final report on "The Utilization of Wood Waste."

White & Wyckoff Calendar Features Famous Bridges

HOLYOKE, Mass.—The ever-popular White & Wyckoff calendars are again starting out on their world-wide travels. The 1947 calendar features "Famous American Bridges." It is a 12-sheet affair, as in the past, and is again printed by the gravure process.

The pictorial headings feature the Brooklyn Bridge; the Baton Rouge, Louisiana, Bridge over the Mississippi River; the Battle Mountain Bridge near Redcliffe, Col.; the Port Arthur-Orange Bridge over the Neches River, Texas; the Capitol Memorial Bridge across the Kentucky River, Frankfort, Ky.; the French King Bridge over the Connecticut River in Massachusetts; the Lake Washington Floating Bridge, Seattle, Wash.; the Golden Gate Bridge in San Francisco, Cal.; the Henry Hudson Bridge over Harlem River, N. Y.; the Cooper River Bridge, Charleston, S. C.; the Bayonne Bridge between New Jersey and Staten Island, N. Y., ending up with An Old Covered Bridge in New Hampshire.

On the backs of the sheets are stories of these famous bridges and also pictures of other noted and interesting bridges in various parts of the country, with stories about them. Nationally-known bridge engineers, architects, bridge builders, governmental authorities and other experts in various parts of the country cooperated in the preparation of the calendar with the author, A. H. Sampson, director of sales promotion and assistant treasurer of the White & Wyckoff Manufacturing Company.

Whiting Replaces His Lost Nautigal

NEENAH, Wis.—Frank B. Whiting, president of the George A. Whiting Paper Company of Menasha and of the Whiting-Plover Paper Company of Stevens Point, now has another Nautigal, to replace the first one which sank in Lake Michigan during a storm in September of last year.

It was necessary to enlarge the boathouse to accommodate the new 57-foot craft, which is more than seven feet longer than the old one. The all-steel hull is powered with two diesel engines of 225 h.p. each, and has a cruising speed of about 20 miles per hour. The Nautigal is equipped with three staterooms, ship-to-shore telephones, shortwave and regular radio reception, electricity for cooking and illumination, and three bathrooms.

Aboard the first Nautigal when it broke apart in the storm were Mr. and Mrs. F. B. Whiting, Mr. and Mrs. George Whiting, Mrs. Robert Schroeder, Mr. and Mrs. Ted Leach and Frank Heckrodt, Jr. They clung to life rafts for nearly three hours before reaching store near Sturgeon Bay, Wis.

KCAA Meets December 10 To Draft Year's Program

NEENAH, Wis.—The year's program of the Kimberly-Clark Activities Association will be charted December 10 at a meeting of its main board. The organization's constitution will be discussed and reports made on unit Christmas partiies.

Elmer Sievert, Badger-Globe KCA unit representative, is president of the main board. Evan Jones, Lakeview mill, is vice president; Dorothy Korotev, main office, secretary, and Shirley Kasel, main office, treasurer.

Everest to Address Tri-State Workers

MENASHA, Wis.—The tri-state convention of the Papermakers, Pulp and Sulphite Workers and Converters union, meeting here December 7 and 8, will be addressed by D. C. Everest, president and general manager of Marathon Corporation, as the main speaker for management. Mr. Everest will speak at the banquet at 6:30 Sunday evening, December 8, at Germania hall. The speaker for labor will be Matt Burns, president of the International Brotherhood of Papermakers. Both men served together during the war in Washington, D. C., on various committees.

The theme of the convention will be "A Job Is a Business." Al Haack, president of the Papermakers union at Marathon Corporation, chairman of the banquet ticket sales, has reported sale of approximately 400 up to November 18, and reservations made with the Germania Ladies Auxiliary have been made for only 500 persons. The auxiliary is in charge of the banquet.

As part of the convention, all industries in Neenah and Menasha will display locally-made products at Germania hall. This will be opened to the public on Saturday evening, December 7.

Decker Heads Slate of Paper and Cordage Group

PHILADELPHIA — The nominating committee of the Philadelphia Paper & Cordage Association reports the following nominees for the coming year: For president—R. H. Decker, Jr., (Dill & Collins, Inc.); vice-president—Frank J. Bushemi (Garrett Buchanan Company); secretary—E. V. Reemter (Hooper Paper & Twine Company); treasurer—H. T. Robinson (Whiting Patterson Company).

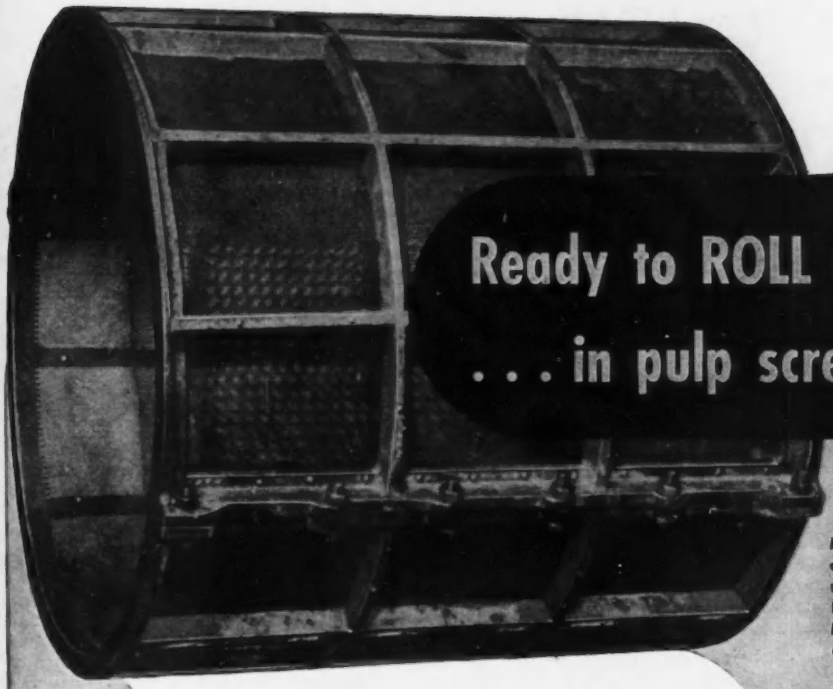
W. Brelis Killhour, Steve DeFarges, Dick Richards and Bill Sullivan were proposed for dirctors; only two, however, are to be elected.

Rhinelander Takes Day Off To Open Deer Season

RHINELANDER, Wis.—The Rhinelander Paper Company was shut down during the last weekend to permit employes to go deer hunting. The state season opened last Saturday, November 23. Paper machines stopped at 4 o'clock Saturday morning to permit night shift workers two hours to complete their tasks and reach shooting spots by 6:37 a.m., the opening time.

W. J. Norton Is Ill

HOLYOKE, Mass. — W. J. Norton, treasurer and director of advertising and sales promotion for the American Writing Paper Corp., is ill at the Holyoke Hospital.



Ready to ROLL up a record . . . in pulp screening

PERFORATED MONEL PLATE **aids the efficiency of centrifugal pulp screens made by Trimbey Machine Works, Glens Falls, N. Y. Strong and wear-resistant, Monel plates hold the size and shape of their perforations longer than other materials.**

Do perforations in your screen plates soon lose their size and shape?

Then here's a suggestion:

For your *next* screens, switch to Monel*. . . and see how much longer they last.

Used in centrifugal pulp screens made by *The Trimbey Machine Works,* Glens Falls, N. Y., perforated Monel plate is reported to outlast other first-line screen plate materials as much as two to three times.

That's not unusual, either, when you consider the properties of Monel.

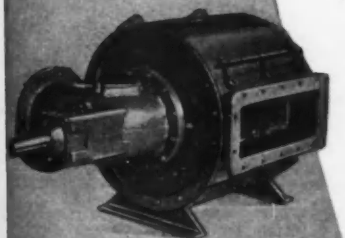
Stronger and tougher than structural steel, Monel is immune to rust, and highly resistant to corrosion by acid and alkaline stocks and solutions.

Monel has high fatigue strength. It withstands wear and abrasion. Perforations remain smooth. Screens don't clog. They not only last *longer*—they serve *better.*

Experienced fabricators find Monel easy to work. Perforations may be as small as 0.055"... or more than an inch in diameter.

Wherever corrosion causes trouble, consider Monel. Use it to construct troughs for charging pulp to flat screens, for example. Monel surfaces are easy to keep clean. They don't accumulate slime and fibre.

And whenever you'd like help in picking the *right* metal for a corrosive pulp or paper mill job, remember that INCO's Technical Staff is always at your service. No fee or obligation. Just write and tell them your problem.



COMPLETELY ASSEMBLED. Trimbey centrifugal pulp screen unit. Its Monel screen plates are automatically cleaned twice during each revolution of rotor.

THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street, New York 5, N. Y.

MONEL

NICKEL (INCO TRADE MARK) ALLOYS

MONEL* • "K" MONEL* • "R" MONEL* • "KR" MONEL* "S" MONEL* • INCONEL* • NICKEL • "L" NICKEL* • "Z" NICKEL*

*Reg. U. S. Pat. Off.

Great Lakes Profit Increases Heavily

TORONTO—Hon. W. Earl Rowe, president and managing director of the Great Lakes Paper Co. Limited, reports that the net income from operations for the nine months ended Sept. 30 was $799,625, as compared with $222,-354 for the same period in 1945.

On November 14 the board declared dividends of $1.75 per share on Class "A" preferred and 45c per share on Class "B" preferred shares, payable Dec. 31, 1946, to shareholders of record Dec. 9, 1946. Payment of these dividends on Dec. 31, 1946, together with the interim payments made previously during the year will represent in total the full fixed dividends accrued from Jan. 1, 1946 on Class "A" and Class "B" preferred issues.

After due consideration of the increasing working capital requirements of the company for future operations and for the temporary financing of its capital expenditure program, it was deemed advisable to defer action as to declaration of dividends on common stock or dividends beyond the fixed accruals on preferred "A" stock.

Mr. Rowe advised that the company is proceeding with its program of capital expenditure for modernization of the mill properties, which it is expected will secure very substantial reduction in operating costs and will also provide some increase in newsprint capacity.

The president stated that, provided no uncontrollable conditions arose, such as curtailment of raw material supplies through lack of manpower, he felt the company could look forward to continued earnings on the level of 1946, or possibly better.

Kimberly-Clark Proceeds With Financing Plan

NEENAH, Wis.—Sale of 70,000 shares of Kimberly-Clark Corporation convertible second preferred stock was begun November 21, as the corporation proceeded with its plans for financing a $40,000,000 expansion program. This program includes construction of a pulp mill of 250 tons daily capacity at Terrace Bay, Ontario, Canada, and installation of additional papermaking facilities at the Niagara and Lakeview mills in Wisconsin and at the Memphis, Tenn., plant.

Completion of this construction will increase the daily chemical pulp capacity of the corporation and its subsidiaries by 49%, and papermaking facilities will be increased by 36%.

The corporation's consolidated net sales for the six months ended last June 30 were $30,390,860 and net income for the period totaled $1,567,246.

International Increases Dividend

NEW YORK—The Board of Directors of International Paper Company at their meeting this week raised the quarterly Common dividend rate to 75 cents a share and also declared an additional year-end dividend of 75 cents a share. During 1946 a total of $3 a share has thus been declared for payment on the company's common stock and this action raises the current quarterly dividend to a $3 annual rate.

The Board declared the regular quarterly dividend of $1 a share on the Cumulative $4 Preferred Stock, a quarterly dividend of 75 cents a share on the common stock and an additional year-end dividend also of 75 cents a share on the common stock. All dividends are payable December 28, 1946, to holders of record at the close of business December 6, 1946.

Bowaters Declares Outlook Improving

TORONTO—Although plant operations of Bowater's Newfoundland Pulp & Paper Mills, at Corner Brook, Newfoundland, have been curtailed due to a poor summer log drive, the outlook has been improved by recent rains, T. H. Winslow, executive assistant to general manager, states.

"The present prospect is that newsprint machines will not reduce operations any further between now and the spring drive which will bring down large quantities of pulpwood which have been held up by the weather," Mr. Winslow adds.

Bowaters recently cut operations by one shift to 17 a week, as a result of a serious shortage of pulpwood at the millsite, caused by insufficient rainfall to provide enough water in the rivers to float pulpwood to the mill. For the present the first eight-hour shift commences at 4 p.m. on Monday instead of at 8 a.m. Weekly repair work ordinarily carried on Sundays will, so far as possible, be performed before the deferred start-up each Monday, Mr. Winslow states.

Meanwhile Bowater's plans for the $7 million mill expansion are taking shape and construction work is likely to start early next spring. Electrical installation changes are contemplated with the new power substation to be framed with aluminum rather than structural steel.

Bagley-Sewall Has Coal

WATERTOWN, N. Y.—Officials of the Bagley & Sewall company, declaring that they had a "fair supply," will not be affected immediately by the coal strike.

FINANCIAL RECORD OF THE WEEK

New York Stock Exchange

High, Low and Last for Week Ending November 23, 1946

STOCKS

	High	Low	Last
A. P. W.	5	4½	4½
Armstrong Cork Co.	46¼	43½	44
Celotex Corp.	26	23¼	23¾
Celotex Corp., pf.	20½	20¼	20⅜
Certain-Teed Products Corp.	17⅜	16¼	16⅜
Certain-Teed Products Corp., pf.	....	....	....
Champion Paper & Fibre Co.	24¼	22¾	22¾
Champion Paper & Fibre Co., pf.	111	110	110
Congoleum Nairn Co.	26	24⅜	24¼
Container Corp. of America	43	39⅝	41
Continental-Diamond Fibre Co.	9½	8⅞	8⅜
Crown-Zellerbach Co.	29¾	26⅞	27
Crown-Zellerbach Co., pf.	105½	105⅜	105½
Dixie Cup Co.	31¼	29¾	29¾
Dixie Cup Co.-A	52	50	51
Flintkote Co.	28	25⅞	26⅛
Flintkote Co., pf.	108½	107	108½
Robert Gair	8⅝	8	8⅛
Robert Gair, pf.	20⅛	20⅛	20⅛
International Paper Co.	48⅜	44	44¾
International Paper Co., pf.	105¼	105	105
Johns-Manville Corp.	128	121⅛	121⅛
Johns-Manville Corp., pf.	120	120	120
Kimberly-Clark Corp.	24	21¼	21½
Mac Andrews & Forbes	36⅛	36⅛	36⅛
Mac Andrews & Forbes, pf.	....	....	....
Masonite Corp.	52½	52	52
Mead Corp.	21¼	19½	20⅜
Mead Corp., pf. 4¼	106⅝	103⅞	103⅞
Mead Corp., pf. 2	49	45⅞	46½
National Container Corp.	31	27½	27½
Paraffine Companies, Inc.	65	63½	63½
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	19	17⅜	17⅜
Rayonier, Inc., pf.	34½	34	34
Ruberoid Co.	50	48	50
Scott Paper Co.	47½	45½	47
Scott Paper Co., pf.	102½	102	102½
Sutherland Paper Co.	44	42⅝	42⅝
Union Bag & Paper Corp.	28½	25½	25⅝
United Paperboard Co.	11⅝	11⅛	11⅛
U. S. Gypsum Co.	112½	107	107
U. S. Gypsum Co., pf.	192	192	192
West Virginia Pulp & Paper Co.	38	32¾	33½
West Virginia Pulp & Paper Co., pf.	114	112½	112½

BONDS

Abitibi Pulp & Paper Co. 5s '53	....	....	....
Celotex Corp. 3¼s '60	....	....	....
Certain-Teed Products Corp. 5½s '53	....	....	....
Champion Paper & Fibre Co. 3s '65	....	....	....
International Paper Co. 5s '47	....	....	....
Mead Corp. 3s '66	....	....	....

New York Curb Exchange

High, Low and Last for Week Ending November 23, 1946

STOCKS

	High	Low	Last
Great Northern Paper Co.	41	40¼	40¼
Hummel-Ross Fibre Corp.	18⅜	17	17⅞
St. Regis Paper Co.	9½	8¼	8¼
Taggart Corp.	6⅞	6⅛	6⅛

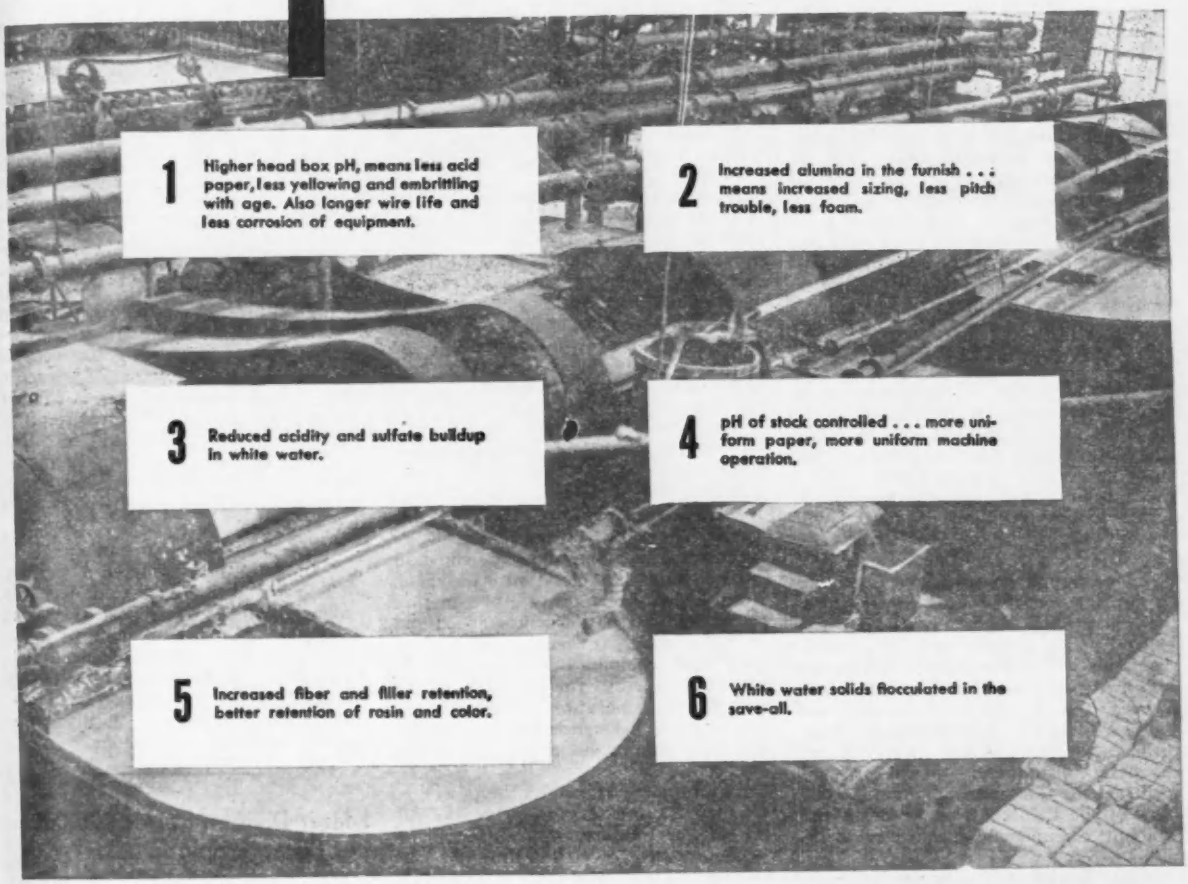
BONDS

American Writing Paper Co. 6s '61	....	....	....

try this for size

MONSANTO'S SODIUM ALUMINATE

...and get these SIX basic advantages:


1 Higher head box pH, means less acid paper, less yellowing and embrittling with age. Also longer wire life and less corrosion of equipment.
2 Increased alumina in the furnish . . . means increased sizing, less pitch trouble, less foam.
3 Reduced acidity and sulfate buildup in white water.
4 pH of stock controlled . . . more uniform paper, more uniform machine operation.
5 Increased fiber and filler retention, better retention of rosin and color.
6 White water solids flocculated in the save-all.

Many leading paper mills are now standardizing on this use of Monsanto's Sodium Aluminate to produce better sized papers . . . to get practical advantages for their own operations.

Experience has proved that one outstanding practical advantage in the use of Monsanto's Sodium Aluminate is the stability . . . 6% solutions remain stable almost indefinitely. It can be mixed at any point in the mills and piped to any point in the system without danger of forming aluminum oxide to clog pipes.

For complete details and experienced technical help in capitalizing on all the advantages of this extraordinary paper chemical in your production, simply write: MONSANTO CHEMICAL COMPANY, Merrimac Division, Boston 49, Massachusetts.

MONSANTO CHEMICALS

SERVING INDUSTRY WHICH SERVES MANKIND

Britons Increase Newsprint Ration

WASHINGTON, D. C. — Having completed arrangements for a substantial increase in supplies of newsprint to the United Kingdom from Canada and Newfoundland for delivery in 1947, the British Government has agreed to permit newspapers in that country to consume additional quantities, as of September 23, 1946, according to a report to the Department of Commerce. Increased consumption this year will be met from newsprint stocks now held in the United Kingdom. This increase, however, will not be as great as users would like and will be far below 1939 levels when average weekly consumption was 23,100 tons.

In addition to restrictions on size of issues, which limited most daily newspapers to four pages, no new subscriptions have been allowed. With the abolition of tonnage quotas and pending further review of the newsprint supply position, papers will be permitted an unlimited number of copies and a very slight increase in number of pages. The relaxation of controls on number of pages will not apply to sports papers and sport editions, although they will be permitted unlimited circulation.

Methods of promoting sales of additional copies will remain severely controlled, since the purpose of the increased allocation of newsprint is to provide expansion in circulation solely to meet already existing demand. The percentage of newspaper surface that may be devoted to advertising has not been revised, although the very moderate expansion allowed in size will permit slightly increased advertising space.

The original contract for Canadian newsprint for 1946 was 250,000 tons, and additional amounts are not expected from Canada and Newfoundland this year. The desire to conserve exchange resources, however, has caused the British Government not only to reduce newsprint imports from Canada to 50,000 tons during 1946, but to defer installment of the original contract by announcing that 160,000 tons of the 1946 contract would be the amount of imports permitted during 1947.

Since British mills now produce only about 35 percent of their prewar output, which then amounted to 800,000 tons annually, imports of pulp are essential. Difficulties have been encountered in attempts to obtain additional quantities of pulp from Sweden, principally because so little British coal was available for Swedish needs.

Imports of newsprint into the United Kingdom during the first 7 months of 1946 averaged 16,423 long tons monthly, compared with an average of 37,195 long tons monthly during 1938. Newfoundland and Canada, which supplied 73 percent of the 1938 newsprint imports, will supply all of the 1947 imports, according to present plans.

British exports of newsprint now are severely curtailed because of inadequate supplies. Only 6,500 long tons were exported during the first 7 months of 1946. These relatively small current exports are permitted to cover the minimum needs of British colonial areas which depend upon the United Kingdom for supplies in order to maintain publication of local newspapers.

Rogers Offers New Grinder Electronically Driven

BUFFALO—The Rogers electronically driven type NT-20 Face Grinder and Knife Grinder is offered as the first machine of its kind featuring adjustable speed accurately controlled by a simple finger tip device. This new concept of precision grinding, exclusive with Samuel C. Rogers & Company, is achieved through an electronic panel, complete with rectifiers and their supporting tubes and circuits.

A single finger-tip dial on the front of the machine permits speed changes within the range of 5 to 70 feet per minute while the machine is running. This electronic drive allows the operator to select exactly the right speed for each kind of work—slow traverse for heavy cuts or fast traverse for light cuts with high finish. Work quality is improved because the electronic drive not only provides correct cutting speed, but holds it as well. This control produces no noise or vibration and no shock at reversals.

The table traverse is started merely by pushing the starting button operating a direct current motor. The speed adjusting finger tip dial can be preset for any speed within the specified range. The motor comes to the preset speed smoothly because of the constant current-limit acceleration provided. Results can be improved by starting the tool into the load at low speed and at full torque. Reversing, quick stopping and complete control is automatically provided for in both forward and reverse operations. Smooth contact limit switches with reversing levers are adjustable to the length of traverse desired.

An ordinary AC source of power is all that is necessary to drive the 10 HP motor. Connection to DC current is automatically made through the electronic panel. The table is 72 inches long and 16 inches wide. Grinding is done by a 20" cylinder grinding wheel.

Park Square Buys General Paper Products

ST. PAUL, Minn.—Park Square, Inc. recently purchased the entire equipment and inventory of General Paper Products, Inc., Marion, Indiana. The purchase includes the factory machinery, stock inventory, office equipment, and good will of the Indiana company. All equipment will be moved to St. Paul and added to the facilities of Park Square's home factory as a part of the company's expansion plans.

Canada Feels Pull Of Foreign Markets

OTTAWA — Canadian pulp producers "have not taken and do not seek the inflated and at times fantastic prices reported in some overseas markets," the Canadian Pulp and Paper Association declared last week in a published statement. But it added that they were faced with a choice of markets as a result of wartime changes in the world supply of pulps.

"The maintenance of United States pulp imports," the statement points out, "has only been possible by virtue of greatly increased supplies from Canada." Canadian pulps now represent about 65 percent of the total United States imports, compared with less than 30 percent in the Nineteen Thirties.

"In the bleached sulphite grades which are in shortest supply, Canadian shipments in 1946 represent more than 90 percent of the total United States imports, and in ground wood pulps over 95 percent," the association declared.

With the removal of Canadian Government export controls, the statement points out, the percentage share of Canadian pulps sold in the United States and Canadian markets has increased materially at the expense of overseas markets. But, although it appears likely that the needs of the United States for pulp imports from Canada in 1947 will be no less than at present, Canadian producers are faced with insistent demands from forty-one other countries whose wants are acute.

With demands that cannot all be met in full, the statement concludes, "it is believed that each Canadian pulp producer will seek, as best he can, to reconcile his desire to achieve a distribution fair to all customers, his desire to establish long-range stability of markets for his products, and the inescapable necessity of assuring reasonably profitable operations."

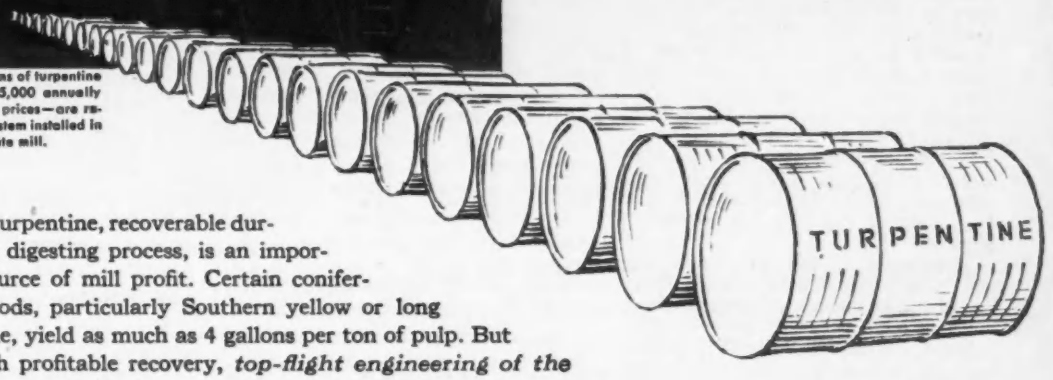
Mazer Division Raises $75,000 For Philanthropic Fund

NEW YORK—A total of $75,000 was pledged by 85 members of the Pulp and Paper Division of the Federation of Jewish Philanthropies at a dinner held last week at the Ambassador Hotel in behalf of the current Federation appeal for $12,000,000 to maintain 116 member hospitals and welfare institutions. This amount, William Mazer, chairman of the division, announced, is a record high for an industry dinner in support of a Federation maintenance drive.

The division plans to continue its efforts with an industry-wide personal solicitation campaign which will continue through January 31, when the city-wide Federation appeal ends.

Six hundred gallons of turpentine daily—worth $45,000 annually at present market prices—are recovered by this system installed in a Southern sulphate mill.

Profits from TURPENTINE RECOVERY



Crude turpentine, recoverable during the digesting process, is an important source of mill profit. Certain coniferous woods, particularly Southern yellow or long leaf pine, yield as much as 4 gallons per ton of pulp. But for such profitable recovery, *top-flight engineering of the system is required.*

Under average mill conditions, Foster Wheeler high yield recovery systems pay for themselves in about 5 months. As a practical example, assume a 100-ton mill processes Southern yellow pine. It would recover daily 400 gallons of turpentine; 120,000 gallons in a 300 day year. At today's market price, 25¢ per gallon, the gross income for 300 days' turpentine recovery would be *$30,000.* A further saving would be realized in the form of heat recovery in the turpentine condenser.

For complete information about this profit-making recovery system, address any branch office, or

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FOSTER WHEELER

New B-S-W Aqueduct Is Five Miles Long

PORT ALBERNI, B. C.—One of the important steps in the construction of a new pulp and paper mill for Bloedel, Stewart and Welch Ltd. has been the erection of a wood stave aqueduct to convey water from Sproat Lake to the mill. This aqueduct is five and one-half miles in length and is designed to carry a maximum of 20 million U. S. gallons every 24 hours. Starting with a diameter of 36 inches, the water line decreases in size to 34 inches and then to 30 inches.

Pumps have been installed at Sterling Arm on the shoreline for the purpose of boosting the water to the greatest height of the line, which is 80 feet above the Sproat Lake level. There will be five pumps in this pump house, each with a capacity of 3,400 gallons per month. Two of these pumps are being put into operation immediately. A third unit will be used for standby purposes and a 200 gallons per minute auxiliary pump is also being installed.

The water pipeline runs from the lake in an easterly direction and crosses the Somass River just north of the pulp mill. At the highest point of the divide, approximately 850 feet horizontally from the lake, a surge tank has been built with a ten-foot diameter. From this point the water will flow by gravity for 17,000 feet, the pipe in this section having a 34-inch diameter. For the next 10,000 feet, the diameter is reduced to 30 inches on account of the land level. Air valves have been installed at high points on the pipe line to release any accumulated air in order to preserve the wood staves by maintaining the pipe full of water at all times. Fire hose connections have been installed every 500 feet along the pipe for fire prevention purposes.

The laying of the water pipe line across the swift-flowing Somass River was the most difficult project, and here unusual methods were adopted. The original scheme called for the pipe being laid section by section across the river, with the necessary connections being made by a diver. As these diver operations could only have been carried on when tides were favorable at certain hours of the day, the job would not only have been difficult, but also expensive and tedious. Wilf Hill, head of the Westminster Welding Company, and Hillside Ironworks Company, New Westminster, suggested that the 24-inch steel pipe could be welded on land, towed to a point where the two ends touched the banks of the river and then sunk into a trench which had been previously dug by a dredge. This plan was accepted by Val Gwythers, chief engineer for Bloedel, Stewart and Welch Ltd., and Allan Stewart, assistant engineer.

Three welders were sent over to Port Alberni from the New Westminster plant and additional crews being secured locally, work was started on this plan. The various sections of the pipe were welded together, on trestles along the river bank. Then the ends of the 600-foot tank were closed in order to make the pipe line buoyant when placed in the river. Tugs then took charge and towed the welded pipe line into position.

In the meantime a dredge had dug a trench averaging 15 feet deep along the river bed and pylons were placed in position to steer the pipes into place. The pipe was floated off the trestles during a high tide. When the pipe was manoeuvred into position a pump on a scrow was used to partially fill it with water, after which a three-inch cock was opened and in two and a half hours the long pipe had sunk into the long-planned position.

At one end a coupling was installed under water and Mr. Hill, who went to Alberni to supervise the final details, donned a diver's suit to satisfy himself that the connection had been made. The regular diver was Ed. Wright, B. C. Marine, who also inspected the trench from end to end. The pipe now rests 40 feet below low water, safe from ship's anchors.

Rather than dig a tunnel into the lake, an electric pump will be used to bring the water into the intake. This will require a transmission line several miles long. It will cross the Somass River by submerged cable to be laid alongside the water pipe.

As a result of the successful operation, Westminster Welding Company has received several inquiries from other points in the province where similar projects are being planned.

The wood staves are being manufactured for the pipe line at the Bloedel, Stewart and Welch sawmill at Port Alberni and will require approximately 700,000 feet of clear kiln-dried fir.

The stock is made from 2 by 6 boards and each is run through a sticker machine in the planer mill. Each stave is given a tongue and groove finish. The staves are shaped to form an arc of the circle of the pipe. Twenty-one staves form the complete circle.

The butt ends of each stave are grooved to admit a galvanized iron plate to make each joint watertight.

The finished pipe is braced together with steel hoops nine inches apart.

The pipe will make available in Port Alberni the enormous quantity of fresh water which is needed to operate a pulp mill.

Under the direction of Val Gwyther, the engineer in charge, the pipe has been designed by A. W. Bonnycastle. A. Stewart is the engineer in charge of construction.

Dr. Kress Explains Institute To Western Salesmen

CHICAGO—The western division of the Salesmens Association of the Paper Industry played host to the entire officialdom of the national organization at its regular weekly luncheon held at the Hotel Sherman on Monday, November 18. The occasion was a remarkably fine address by Dr. Otto Kress of the Institute of Paper Chemistry. The official family was properly headed by President of the SAPEYES, F. O. "Pat" Patterson who came down from the Flambeau mills especially for the occasion. Also present was E. F. Miles, Crocker-McElwain Paper Company, vice-president of the Eastern division and Allen Hellfrich, St. Regis Paper Company, also of New York and assistant vice-president of the Eastern group. To make the day complete, all were introduced by Ed Edwards of the Howard Paper Company, vice-president of the western division.

The speaker, Dr. Kress, simply spoke of what was closest to his heart in recounting the history of the Institute from the days when it had "nothing but the idea" to the present strong and helpful position it now maintains in relation to the paper trade which is so enthusiastic about its performance. The speaker outlined the problems confronting the Institute and its research departments, including a reference to the employment situation and to the difficulty mills were having in getting suitable rags for rag mill production. He also stressed the need for reforestation and the necessity for coordination of effort on the part of all branches of the paper trade to insure the future growth of the paper industry. It was a delightful meeting, made so not only by the presence of so many distinguished guests but likewise by the sincere and enthusiastic talk given by Dr. Kress, which was exceptionally well received.

Central Paper Company Reorganizes Laboratories

MUSKEGON, Mich. — With the new research laboratory of Central Paper Company, Inc., of Muskegon nearing completion, the company has completed plans for the initial reorganization of the company's technical staff. Robert L. Knickerbocker, chemist with the company for a number of years has been appointed director of control laboratory with this same title. This appointment takes effect immediately. Mr. Knickerbocker is well fitted to assume this position because of his previous experience with the company.

Mr. Knickerbocker's duties will be complete charge of the technical control of the company's processes and products. This step along with the separation of the control laboratory from other research work performed by the previous staff will add to the efficiency of control and quality of the products manufactured by the company.

marking the course . . .

AS the channel marker safeguards the advance of ships through harbors and rivers, so do the findings of the pioneer research chemists provide "sure passage" for advancing industry.

Pioneering in electro-chemical product development, Niagara has helped to chart many new courses by which various industries are going forward. In addition to producing Caustic Potash, Carbonate of Potash and Liquid Chlorine for the first time in America, Niagara has consistently led in adapting these materials to new uses.

The specialized "know-how" and experience Niagara has gained in this work are the basis of the alert and progressive product service which Niagara offers to its customers throughout industry.

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Indianapolis Finds Supply Still Low

INDIANAPOLIS, Ind.—Executives of paper mills in this section are beginning to wonder if troubles ever will cease. Just at the time when they appeared to have the "go" sign with all price regulations removed, comes the coal strike. Some of the plants are more fortunately situated than others because they have fair coal reserves. It is not likely that any of them will operate much after thirty days, even if they cut their production, which some are prepared to do.

Demand for most grades of paper continued heavy last week and with the coming Holiday season almost here, manufacturers and jobbers are wondering what is to be done. Wrapping paper and bag demand has jumped decidedly and it is not all due to the holiday season. Laundries and cleaning plants are finding it increasingly difficult to secure adequate supplies. Demand for tissues of all kinds continued heavy with prices rising and supplies low and nothing to indicate an improvement.

Newspaper publishers also are in a quandry. Newsprint demand continued strong with prices rising. The publishers are trying to take all the advertising they can, but when they try to rationalize their rising labor costs, paper costs, taxes and all other costs, they wonder what is to happen. If everything continues as it has been in the past two months, there will be a radical increase in advertising rates during the next six months.

Building paper and roofing demand continued strong in view of the continued good construction weather and supplies of roofing are diminishing. Severe weather will give distributors an opportunity to build up their stocks.

Waste paper buyers in this area are having a fine time with prices at a very high level. However, collections are none too heavy, but the local trade is well satisfied. Much the same condition is true in the rag market.

Continued good construction weather has caused a steady demand for roofing and building papers. This demand would be far greater if it were possible to secure some badly needed other building materials, to say nothing of the skilled labor necessary. Both are lacking sadly.

Women continued last week to stand in line to secure tissues of all kinds, particularly toilet tissues. Hotels say they are having a difficult time securing adequate supplies and in some instances are having to patronize retail outlets.

Kraft demand is far ahead of supplies and the holiday season is nearly upon the trade. Holiday sales have been made early this fall and continue to be made, but the big rush is expected to begin this week. Prices are strong.

Best grade rags last week were much in demand with local warehouses virtually empty. However, with controls removed, it is expected that prices will rise sharply and some warehouse stocks that have been held will be put on the market.

Oldham Opens Laboratory To Develop Processes

BUFFALO, N. Y.—The Oxford Process, Inc., has purchased the four-story building at 68 Main Street and has leased the property to an affiliate, the American Industrial Company, which is establishing offices and laboratories there to promote newer methods of making paper and to design and sell papermaking machinery. The business of the American Industrial Company is centered in development and application of the Sterling process for making newsprint from de-inked newspapers. Its president is F. B. Oldham.

Mr. Oldham said that within a few months paper plants will be in operation at undisclosed points, where newsprint will be made from de-inked old newspapers, and that laboratories will be in operation here in the near future to make newsprint pulp by what Mr. Oldham describes as a "chemical-mechanical process."

The company, pulp and paper mill consultants, plan to set up papermaking plants on a royalty basis, said Mr. Oldham, who has been consulted recently by a number of newspapers needing a greater supply of newsprint, as well as by other publishers and manufacturers.

ACME Meeting Features New Industrial Products

NEW YORK—New industrial products and new engineering techniques will be highlighted in many of the 200 odd technical papers at the 67th Annual Meeting of The American Society of Mechanical Engineers at the Hotel Pennsylvania here the week of December 2. Nearly 6,000 engineers are expected for the five-day meeting, making the attendance the largest in the Society's history.

United Paperboard Nets $280,000

NEW YORK — United Paperboard Company reported net profit of $280,000 for the twenty-week period ended Oct. 19, stockholders were told last week at the annual meeting. Net income for the fiscal year ended May 31 was $87,326, equal to 18 cents a share.

Eddy Declares Special Dividend

NEW YORK—A special dividend on its common stock of $6 per share has been authorized by the Eddy Paper Corporation, Three Rivers, Que., payable December 12 to stockholders of record December 2. This brings to $13 the dividend disbursements per share in 1946 compared to $4.50 paid in 1945.

Hauck To Expound Pollution Costs

PITTSBURGH—What stream pollution costs industry, and its effect on recreation and public health, will be dealt with by Charles F. Hauck, Hall Laboratories expert, in a paper to be delivered at Haddon Hall, Atlantic City, December 3, before the thirty-ninth annual meeting of the American Institute of Chemical Engineers.

Hauck is head of a special engineering service at Hall Laboratories handling problems of industrial waste and stream pollution. He formerly was assistant plant engineer at the Ravenna Ordnance Center and for five years before that was senior chemist and assistant to the superintendent of the Southerly Sewage Treatment plant, Cleveland.

Principal reasons for stream pollution abatement, Hauck believes, are (1) public health hazards produced by pollution, and (2) injury to recreational value of streams, lakes and tidewaters. Industry, he says, suffers from uncontrolled pollution through definite degradation of surface water supplies. Plants compelled to use grossly contaminated water must either pay more for suitable water or bear the penalty of using objectionable water.

Usually, he adds, the adverse effects of using polluted water result in higher maintenance costs on equipment using impure water. Less frequently, product quality or operating efficiencies are lowered by temporary concentrations of inimical substances in the raw water. The sum total of tangible expense absorbed annually by industry as a result of waste contamination of its water supplies amounts to millions of dollars.

The answer—although it is expensive—is to treat the waters chemically to eliminate impurities and to recover valuable chemicals, Hauck says. By so doing, fish and other wild life can be conserved and recreational facilities protected, while the hazards to health can be greatly reduced.

A number of other talks will be given at the meeting on the subject of chemical treatment of industry wastes.

Spain Raises Its Capacity

WASHINGTON, D. C.—The Spanish paper industry increased its capacity to nearly 330,000 short tons during 1945, from about 220,000 tons in 1936, according to a report to the Department of Commerce. Operations were at only 60 per cent of capacity during 1945 because of the shortage of raw materials, a large proportion of which must be imported.

Imports of paper and related products totaled approximately 42,000 tons during 1945, compared with 67,000 tons during the preceding year. Of last year's total, 220 tons were supplied by the United States. Exports of paper and related products amounted to only about 1,000 tons annually during 44-45.

Wisconsin Mills Examine Proposed Cutting Curb

(Continued from page 7)

At Wisconsin Rapids, Charles F. Smith, Wausau, commission member, said he felt that some of the protests against the original bill were legitimate, but that these had been removed in the new draft, and that further modifications could be made on the basis of suggestions at the hearings. Mr. Smith pointed out the disastrous effect of indiscriminate logging in the past, and the present efforts to put forestry in the state on a sound basis.

"All through the Wisconsin river valley is a prosperous paper indutry," he said. "Everybody lives off the paper mills in one way or another. But they are having to go to Canada to get their pulp and are making big investments there of money which could be spent locally. Only twenty per cent of their raw material now is being produced in the state. Many saw this coming, but nothing was done. The conservation department has developed a real fire protection system and now is emphasizing planting and raising trees but only a small part of the land is state-owned.

"We must do something, for we don't want the paper mills to go the way of the sawmills and we don't want the paper mill towns to go the way of the northern communities."

E. J. Vanderwall, conservation department director, said that the twelve major parts of the bill aim to provide "a continuing opportunity for workers to find employment in the woods and mills and to assure a future supply of forest products for national defense and essential civilian needs."

He said that only the cutting of forest products for manufacture or sale would be subject to supervision and the following species would be affected: Jack pine, balsam fir, white spruce, black spruce, white cedar, hard maple, yellow birch, basswood, soft elm, rock elm, red oak, white ash, hemlock, white pine and Norway pine.

Referring to the proposed legislation, F. G. Wilson, head of the state forestry division, said: "The restraint is only on immature timber. The bulk of present private plantations are too young to help the paper industry as yet. Hemlock is a disappearing species and much aspen is being cut but the paper mills still need the longer spruce fibers and are having to ship it from Montana at prohibitive freight rates. Unless we re-create our forest lands, the mills will either have to move closer to the supply or lose out to competition more favorably situated."

He suggested height as the best standard for determining maturity, and declared that more profit could be made before clear-cutting."

F. G. Kilp, forester for Nekoosa-Edwards Paper Company, filed a statement as "definitely in favor of some kind of a regulatory bill." He reviewed Nepco reforestation efforts during the last twenty years, and added that the company couldn't operate without imports.

W. W. Clark, Vesper, state assemblyman, wondered if the Trees of Tomorrow, Inc., idea of planting two trees for every one cut could not be incorporated into the bill. Walter Wollschlager, Necedah, said he had tried this idea, but that deer ate all his seedlings. He added that "beaver planted by the commission have destroyed more trees on my land in one year than I have in 40." He was among those opposing the proposed regulations.

E. B. Hurst, wood buyer for Consolidated Water Power and Paper Company, recalled that when he came to the state in 1924 there was nothing but burned and cut-over land and no fire protection. "We have the best fire protection system in the country and it protects young growth. If we'd have had it 30 to 40 years ago, we wouldn't be here today.

"The same now applies to cutting immature timber. We must do something to stop it. Mills have certain specifications but a surprising number don't live up to them and will continue to cut undersize even after having as much as an entire car rejected."

In contrast to the other hearings, the one in Green Bay was attended by only a small number of representatives of the industry. The group was addressed by Mr. Wilson and Ernest Swift, assistant state conservation director, who presided. The discussion in large measure duplicated that at other meetings.

It showed a general sentiment in favor of state forest harvest policing, although some of the paper mill men appeared apprehensive about the effect of controls suddenly applied upon the supply of pulpwood at a time when the mills are finding procurement increasingly difficult because of labor shortages in the United States and Canada.

Clayton Ewing of the Falls Paper and Power Company of Oconto Falls said that the paper mills are "vitally interested" in forest conservation, but that they will demand a regulation policy that recognizes their problems of supply during unfavorable times.

A final and statewide public hearing on the proposed forest regulations will be conducted by the Conservation commission in Milwaukee on December 9, the state officials announced.

Valley Works Adds to Shop

APPLETON, Wis.—A $25,000 addition to its shop is being built by the Valley Iron Works. The building will measure 60 feet, 5 inches by 80 feet and will be 38 feet high to house a twenty-ton crane. Exterior of the addition will be of haydite and brick. The Hoffman Construction Company of Appleton has the contract.

Taylor Tells of Trees To Chicago Group

CHICAGO—The importance of trees to the entire economic world was set before members of the Chicago Professional Paper Group on Monday evening, November 18, by M. H. Taylor, Executive Director of Trees for Tomorrow, Incorporated. Meeting at the Chicago Bar Association rooms, the enthusiastic audience had ample opportunity to gain a first hand knowledge of the work of the movement as Mr. Taylor used visual records both in book and chart form to show the work of his organization, particularly in the Wisconsin area. His group is a non-profit organization of the Wisconsin Valley paper making industry, founded to help advance the renewal of forest growth. Accordingly, the speaker stressed the educational efforts the association was putting forth to promote the growth of trees on typically forest land in northern Wisconsin. He outlined the interest of the schools in the subject of reforestation, spoke of the installation of courses on forestry in some high schools and illustrated the "School Forest" program whereby school children had developed their own project of planting and caring for the trees for tomorrow. Mr. Taylor did a most excellent job of convincing his audience of the profound influence trees and their products have on our daily lives and of warning those present that indiscriminate violation of this great gift of nature could lead to irreparable loss to the entire country.

Mr. Taylor was introduced by Al Roach, vice president of the Chicago Professional Paper Group and an executive with the Welch Manufacturing Company. The Group's next meeting, in December, will feature the annual Christmas party with little speaking, open house, and plenty of genuine good fellowship.

New Norton Plant To Be Started Soon

WORCESTER, Mass., Nov. 18—Norton Company has recently recalled plans for the construction of a building to be known as Plant 7, to be located on the present parking lot of the old fairgrounds west of the railroad tracks at Barber's Crossing.

Built specifically for the manufacture of vitrified grinding wheels, the plant is to be 540 feet long and 320 feet wide (nearly 4½ acres in area), providing 172,000 square feet of floor space.

Ground will be broken early in 1947, but it is not expected actual manufacturing operations in the plant will start until the beginning of 1948. Much depends on the availability of scarce building materials and equipment plus the granting of government permits to obtain such materials as are vital to the project.

Newsprint Men Wait Decontrol Effects

TORONTO—Most directly affected by the latest U. S. decontrol measures are Canadian exports of lumber, woodpulp, pulpwood, newsprint and other paper products. From now on there will be no price ceilings on these items when sold in the United States, except the price to the consumer there is prepared to pay.

While no immediate action seems likely to be taken in Canada, there are many facts to be considered. Perhaps the first is that none of the higher ceilings set by the OPA at Washington has met with the unqualified approval of the Canadian industry, which has always before it the much better newsprint prices that could be obtained in countries other than the United States.

However, there appears to be no likelihood that Canadian newsprint mills will follow the example of the U. S. copper, lead and zinc producers who promptly put up prices when the OPA control was liquidated.

Instead, it seems probable the industry will wait for some time and watch the trends that develop in other lines of American industry. Two items that would have immediate repercussions would be increases in American freight rates and prices of fuel. Newsprint mills on the Canadian side of the border could not afford to absorb such increases which, at least as regard freight rates, appear to be inevitable.

The long-range view is not disregarded, that American consumers are the natural outlet and that accordingly the prices the U. S. consumer can afford to pay must be a guide in setting Canadian sales prices.

It would seem the matter of newsprint prices is one that should be settled by the whole industry, rather than by individual producers. In this, however, the Sherman Act has a serious effect, for a number of executives of Canadian mills are American citizens —and could be careful indeed before they ran any risk of being put into an American jail for an offense against the combines law!

Initial reaction of Canadian pulp and paper companies, however, will be one of "watchful waiting." Ending of OPA controls may mean that Scandinavian producers of woodpulp and newsprint will receive higher prices. Heretofore shipments of woodpulp from Northern European countries to the United States were exceedingly low, mainly because U. S. prices were considered unattractive. Whether newsprint shipments to the United States from Scandinavia will now be resumed, in what amounts and at what price, are something which Canadian producers will now no doubt most carefully watch.

Should Scandinavian exporters now make U. S. pulpwood and newsprint contracts in any volume at prices higher than those currently enjoyed by the Canadian industry, it may be expected that Canadian firms will consider revising their prices.

Wells Backs APMEW Patents; Is Granted a New One

GLENS FALLS, N. Y.—H. D. Wells, president of the American Paper Machinery and Engineering Works, Inc., this week commented on the news item in PAPER TRADE JOURNAL, of November 7th issue about an infringement suit of Cowles Company and Black-Clawson Manufacturing Company against SAN-NAP-PAK Manufacturing Company and Frost-White Paper Mills. The privilege to use APMEW bale pulpers and beaters, he declared was given by the United States Government over twelve years ago, and he asserts it will be confirmed soon by the United States District Court. APMEW bale pulpers and beaters are manufactured and their use is licensed under one or more of the 158 pulper and beater process and apparatus patents to H. D. Wells and by arrangements with others.

Harold Donald Wells, of Glens Falls, received a patent this week on a pulp beater and selector according to official announcement of the United States Patent Office. Mr. Wells filed for his patent June 27, 1942, and patent examiners ruled the invention different in five respects from anything similar ever previously patented or known."

Heating-Ventilating Show Opens January 27 in Cleveland

CLEVELAND — Exhibits numbering close to 400 have been allotted space in Lakeside Hall, where the seventh Interantional Heating and Ventilating Exposition will be held January 27-31, and while a majority are being staged by long established manufacturers, many of which have been producing heating and ventilating equipment for many years, their products are almost invariably new or improved.

The group of exhibits featuring instruments and controls is a very large one, revealing great progress. For example, there is a new type of thermostatic bimetal, which is held to be from 30 to 40 per cent more active thermally than bimetals previously available. There is also a new precision dew point indicator, which requires no external cooling medium, and which can be read accurately by more than one operator. Still another exhibit combines damper controls, limit controls, thermostats, fire pilot controls, gas heating and unit heater controls and controls for attic and window fans.

American Can Adds To Research Space

MAYWOOD, Ill.—American Can Company's research facilities at the central laboratory have been enlarged 25 percent with the completion of the remodeling of a third building, James A. Stewart, vice-president in charge of research and development, has announced.

This building, which was inspected by several hundred industrialists and scientists during celebration of the 40th anniversary of the company's research division on November 20, has about 16,000 square feet of floor area. It brings the total research space at Maywood to approximately 81,000 square feet, Mr. Stewart said.

Most of the increased space will be allotted to the metallurgical, biochemical, bacteriological, fibre container, food inspection, and engineering groups.

The non-metallic container group is presently engaged in studies of moisture evaporation through frozen food containers, of the protective qualities of plastic containers, and of the strength and protective qualities of fibre containers for milk and other products.

American Can's research division has grown steadily through the years in step with diversification of the company's business and the ever-increasing service requirements of its customers. The company presently makes 2,000 different types of containers, using metal, fibre, and various combinations of metal and fibre.

Its original laboratory, the first in the can manufacturing industry, was opened at Niagara Falls, N. Y., in 1906 with a staff of two men, he said. Today 200 persons are employed in research work at Maywood, and 80 persons are employed in division research offices and laboratories located elsewhere in the United States. Dr. B. S. Clark is director of research, and Dr. R. W. Pilcher is associate director of research and manager of the central laboratory.

Fort Wayne Declares Dividends

FORT WAYNE, Ind.—Dividends on preferred and common stock were declared by the board of directors of the Fort Wayne Corrugated Paper Company at a meeting last week. A yearly dividend of $1.25 per share on the common stock was declared payable December 27, 1946, to stockholders of record at the close of business December 14, 1946.

A quarterly dividend of 28 and one-eighth cents per share was declared on the four and one-half per cent cumulative convertible preferred stock payable January 1, 1947 to stockholders of record at the close of business December 14, 1946, according to E. L. Rich, treasurer of the company.

Eastern Exposition Reopens Next Year

SPRINGFIELD, Mass. — For the first time in six years, the Eastern States Exposition will resume its West Springfield showing in 1947, with numerous paper plants from the six New England states, New York, New Jersey and Pennsylvania among the leading exhibitors, General Manager Charles A. Nash has declared, adding that the committee had scheduled Sept. 14-20 as the dates for the show.

Agreement by the WAA to relinquish the buildings progressively so that all will be back in the control of the Exposition management by June 1 of next year, paved the way for the 1947 show. Restoration work has been completed in the Coliseum, and necessary work will be done on the other structures as fast as they are returned to the Exposition management.

General Manager Nash said that all basic departments and features will be continued, and many new ones added.

Loddengaard on United Board

NEW YORK — P. M. Loddengaard, vice-president in charge of operations of the United Paperboard Corporation, was elected a director at the annual meeting of the board. All of the present officers were re-elected. George J. Walters was appointed assistant secretary and assistant treasurer.

THE chart above, made at the plant of a large paper manufacturer, is positive proof of the constant, uniform delivery of Warren Machine and Jordan Chest Centrifugal Pumps. It shows a 24-hour record of stock level in the regulating box... head in chest varied from 0 to 8 feet, yet practically throughout the entire test, the Warren Machine Chest Pump maintained the regulating box level *constant to a fraction of an inch!*

A Warren Centrifugal Chest Pump gives you these advantages over a plunger-type pump: smooth flow without pulsation; discharge valve can be closed and not build up excessive pressure on pump and discharge line; takes up less floor space and much less head room; no pockets to hold old stock; a diagonally split case makes it unnecessary to remove discharge piping—rotating member can be easily lifted out; no noisy gears to create vibration.

The maintenance charges of a Warren Centrifugal Chest Pump are low as compared with a plunger pump. Renewable liners prevent wear on suction heads—there are no plungers to be turned or replaced. *And in addition, the initial cost of a Warren Centrifugal Chest Pump is lower than that of a plunger pump of much smaller capacity.*

A Warren Centrifugal Machine or Jordan Chest type pump . . . in operation in *your* plant . . . will assure uniform delivery under varying conditions of suction, submergence and density of stock. Write for complete information and list of installations.

Warren Pumps

CENTRIFUGAL *AND* RECIPROCATING PP-4½

Warren Steam Pump Company, Inc., Warren, Massachusetts

Brotherhood Wins Election At Marinette Plant

MARINETTE, Wis.—A total of 404 of 429 eligible employes cast their ballots in the Marinette Paper Company union's election on November 10 and 20. The International Brotherhood of Pulp, Sulphite and Paper Mill Workers (AFL) was chosen as the bargaining agent, 230 to 174, according to Wellington S. Meyer, Menasha, union representative.

Production Ratio Off But Remains Five Points Over Top

NEW YORK—The ratio of United States paper production to mill capacity for the week ending November 16, as reported by the American Paper and Pulp Association, was 104.9 per cent compared with 106.8 per cent for the preceding week and 96.4 per cent for the corresponding week a year ago. This does not include mills producing newsprint exclusively. Paperboard production was 101 per cent for the current week compared with 102 per cent for the preceding week, and 95 per cent for the corresponding week a year ago.

OBITUARY

Graham P. Prather

NEW YORK — Graham P. Prather, forty-two, designer of paper mill machinery, died November 17, at Midtown Hospital, 309 East Forty-ninth Street, after a short illness. His home was at 166 Carlton Terrace, Teaneck, N. J.

Mr. Prather was born in St. Louis and was educated in public schools there and in Detroit, and in New York. He was graduated from Syracuse University in 1924 as an engineer, and was an engineer for public utilities companies and other concerns before becoming a designer of paper mill machinery.

He worked for the Dilts Company, of Fulton, N. Y., for five years, and then for the H. L. Rust Company, of Pittsburgh. Before joining the Glasco Corporation, East Paterson, N. J., Mr. Prather was employed by the Nichols Engineering and Research Corporation of New York, consulting engineers.

Surviving are his wife, Mrs. Margaret McCabe Prather; a son, Clark; three daughters, the Misses Margaret, Ruth Ann and Pamela Prather; a brother, Clark, and his mother, Mrs. Daisy Prather.

William H. Redlien

WALLOOMSAC, N. Y. — William H. Redlien, formerly general manager of the Walloomsac Paper Mills, Inc., died suddenly recently at his home at Baldwin, L. I., from a heart attack. He was prominent in fraternal circles while a resident of this village. The principal survivors are his widow, a daughter and a son.

Ferguson Develops Standard Building

NEW YORK—The H. K. Ferguson Company, industrial engineers and builders, reveals that it has developed a modern, steel frame, fire-resistant factory building which can be built at a cost of three dollars per square foot on today's market. The average cost of conventional and individually designed industrial structures ranges from five dollars to seven dollars per square foot at the present time.

"The offsetting of current construction costs to figures more in keeping with manufacturers' capital limitations has been the goal of our design staff for many months," A. Kingsley Ferguson, president of The Ferguson Company, said in disclosing the new building development. "The result is a structure which can be built for three dollars a foot, complete with all normal services within the building."

A statement by the Ferguson company emphasized that the low cost building is a "typical building for a typical industry." It can be utilized best for warehousing, machine shops or light manufacturing.

"It is not a specialized building for a heavy industry," the Company statement explained. "Our design represents a minimum requirement and is directed primarily toward a goal of low first cost without sacrificing any desirable features required for low cost maintenance or satisfactory production layout."

Ferguson engineers said the three-dollar-per-squarefoot cost could be achieved in any application of the new design in quantities of 250,000 or more square feet of floor space. The price assumes ideal site conditions in either a metropolitan or a rural area.

The low cost construction figure is predicated on two principal factors. One is the simplicity of building design, the other the simplicity of erection.

The design of the building is based on the use of standardized components throughout the entire structure. This may be best illustrated in the structural steel frame design, which requires 5.2 pounds of steel per square foot of floor space compared to seven to ten pounds for buildings using monitor-type trusses.

The steel design is such that every beam, every column and every purlin in the structure is identical. This factor reduces steel fabrication costs considerably, since long production runs can be attained in the manufacture of these items. It simplifies steel erection so that trained field crews can assemble the components at a remarkably low cost.

The mass production principle is also carried out in other building units. All interior footings are identical and all wall footings are the same, a technique which permits reuse of concrete forms over and over again. The same principles apply to heating, general lighting, plumbing, sprinkler, and sewer systems.

"By using simplified design lending itself to mass production methods," the company announcement stated, "we are able to keep construction costs at a minimum level."

Ferguson engineers have also devised other money-saving techniques in the design of the structure. The 20-year bonded roof is dead level, a condition which eliminates the need for extra roof carpentry and complicated steel and flashing designs. Another economy is the fact that there is no masonry above the window sash line, a condition which does away with the erection of expensive scaffolding and extra steel and masonry above the sash line.

The building designed by The Ferguson Company is completely modern in appearance. Its exterior is painted concrete block. The bays in the structure are 24 feet by 35 feet and the ceiling height is 16 feet or less. It has a five inch thick reinforced concrete floor slab with a monolithic finish, and its 20-year bonded roof is placed atop a metal deck insulated with fiberboard. The structure contains its own projection-type heating system, complete with boilers, firing equipment and other boiler house auxiliaries. It is well-lighted, has an approved sprinkler system and proper underground drainage. Toilet facilities are also included.

"We must point out," the statement said, "that this three dollar a foot building has many limitations. It definitely is not the answer to every manufacturer's building problem. Instead, it is merely an economical way to provide what we call 'minimum' floor space requirements. We are able to meet this price only when we can build the structure as a unit that will afford us long production runs on steel, piping and other basic components in our simplified design. If manufacturers have special problems such as heavy overhead cranes, obviously the cost of the building will be more. The same is true of that part of the building which the owner wants finished off as office space."

"It is also important to add," the statement continued, "that quality has not been sacrificed in either materials or workmanship to bring about low cost. We will stand behind this new design on the same basis as we stand behind our other buildings, and we can give definite assurance of its low cost maintenance."

Completion data on this type structure cannot be predicted with any degree of accuracy under present day circumstances. However, it is estimated that part of the structure can be ready for useful occupancy by an owner six months after a specific project has been approved by the Civilian Production Administration.

Merritt-Chapman-Scott Elects Lyford President

NEW YORK—Directors of Merritt-Chapman & Scott Corporation this week elected Frederic E. Lyford as President and Director of the Corporation. He succeeds Lewis L. Smith who is retiring after forty years of service. Mr. Lyford joined the organization in 1944, as assistant to chairman of the board.

He is a graduate of Cornell University, where he received his engineering degree in 1916. Since then he has had a wide and varied experience in the engineering field. Some of his former associations were as assistant to vice-president, Baldwin Locomotive Works and from 1937 to 1944, trustee, New York, Ontario & Western Railway, in complete charge of operations and finance.

Mr. Lyford served as Chief of American Railroad Mission to Portuguese railroads in Africa for the Office of Economic Warfare. At the same time he conducted investigations for the French railroads in French Equatorial Africa. In 1944 he was engaged by Bankers Trust Company as Valuation Expert in connection with the Seaboard Airline Reorganization.

Corris Joins Lawson as Assistant Sales Manager

David W. Schulkind, president of E. P. Lawson Company, has appointed Richard C. Corris as assistant sales manager. In addition to his responsibilities in sales, Mr. Corris will supervise the formation of Lawson's Export Sales Division.

Mr. Corris was restored to inactive status in the Naval Reserve in August of this year with the rank of Lt. Commander, after serving more than three years of combat sea duty in the Atlantic and Pacific Ocean Areas. Prior to enlisting in the Navy, Mr. Corris had extensive sales experience in the Midwest, working in an executive capacity for Marshall Field & Co., Sears, Roebuck, Inc., Esquire Magazine, and Box Service Corporation.

Mr. Schulkind further revealed that deliveries are now being made on the new Lawson "38" Paper Cutter, and the Lawson Multiple Head Drill Slotter. The Lawson "44" and "50" Paper Cutters will be in quantity production at an early date.

Denies Tax Relief To Southern Kraft

ARKADELPHIA, Ark.—County Judge Dick Jackson of Clark county has denied an appeal filed by the Southern Kraft Paper Company from a ruling of the Clark County Assessment Board, which increased taxes on lands of the company in this county to an average of $3 per acre. The board claims that the assessment is equal to that paid by other landholders with similar tracts, both corporate and individual.

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

W. L. Cook, Editor

M. Duplessis Would Set Limits

Without presuming to discuss the political economies and pressures of neighboring and time-proven old friends, the pulp and paper industry will still view with mingled feelings the reiterated statements of Premier Duplessis of Quebec's Provincial Government as to what he will and will not permit in the future development of the Province's forest industries. There is every inclination to assure the Premier of a sympathetic understanding of the pressures that have brought him to the frame of mind which he has expressed in the policy. There is also a good deal of trepidation over the end results of any policy that seeks, by Government fiat, to restrict this or to limit that commodity. The pulp and paper industry on this side of the border is still reeling from a prolonged orgy of arbitrary and artificially operated restrictive controls.

On the positive side of the argument is the undisputed fact that the available timber limits for further use is fast running out. Considerable opposition to this state of affairs has been developed over the years among quarters that have come to feel the pulp industry is filling the role of favorite son, and that American publishers, in their prices that they pay for paper, are enjoying privileges at the expense of the Province's citizens. While the pulp user may deplore this frame of mind he is quite as ready to see how it may have arisen as a political point of argument.

More specifically, the Premier has avowed an ambition to safeguard the Quebec paper industry from any likelihood of falling into the ownership of some of its largest customers. There, even with the best intentions in the world, a certain amount of artificial and arbitrary motivation has been allowed to enter the political arena, even though its purpose be to offset an equally artificial and restrictive type of action which has not been too warmly welcomed by the paper trade on this side of the border.

Premier Duplessis told the Quebec Forestry Engineers' Association that the province did not favor granting timber limits to newspaper owners and publishers. He said that newspapers in the pulp and paper business would not help freedom of speech, and might present the possibility of paper owners controlling the paper industry and the newsprint market. Some observers have taken the Premier's statement to be the answer to rumors that United States publishing interests were attempting either to gain control of prominent paper company's stock or assets, or timber limits held by the company. Now that the policy has been laid down, it is felt locally that these interests might find it extremely difficult to break into the Canadian pulp and paper business.

To this the American Newspaper Publisher's Association has replied by stating that "information from Canada indicates that there is no law or regulation which would prevent construction of a newsprint mill in Canada." It admits, however, that a new mill requires timber limits which would not be easy to get.

The third point of the credo that is accredited to the Premier is looked on with a good deal of favor in some Dominion circles. It must be respected. The general idea is that by keeping future developments within imposed limits the Province will be more easily able to exert a control over the market—at least to influence the market heavily—and thus be able to achieve either or both of a couple of ends. One; the value of such control as a bargaining agent is not overlooked when trade agreements are under negotiation. Two; the avoidance of a boom-ridden over-expansion which may not bring tangible profit to the citizens of Quebec, but certainly carries an ever-present threat for them in its later deflation, is to be held within the responsible duties of the provincial government.

But government policies in this country, too, long were aimed at an arbitrary control to avoid the deflation which was so constantly preached as to cause many to regard it as a political rather than an actual threat. And, Brother Duplessis, what we got in the way of control was plenty.

Impartial observers who witnessed the lean years in the pulp and paper industry in the last decade, are said to think attempts by the province to stabilize the industry, are all to the good. It is stated that officials would like to see close liaison between Ontario and Quebec with regard to the pulp and paper industry, thus assuring that Canada would gain a fair control of the market. If this can be accomplished, they are said to feel that any serious falling off in demand and production can be avoided.

It may well be that the Premier also will have some forward-looking proposals to advance to his constituents. Pulp and paper men will fervently hope that he will talk more, but about his plans to encourage, not discourage, and that his proposed controls will be such as to not only safeguard the citizens of his province but to enhance their individual and collective well-being.

Calendar of Coming Events

February 23-27, 1947—The American Paper and Pulp Association, Annual Meeting, The Waldorf-Astoria, New York City.

TAPPI Notes

E. Archie Harper, formerly of the Brunswick Pulp & Paper Company, is now pulp mill superintendent for the Hudson Pulp & Paper Corporation, Palatka, Fla.

The TAPPI Ohio Section will meet at the Manchester Hotel, Middletown, Ohio on Tuesday, December 3rd, at 6:30 p.m. At this meeting a number of members will report on simplified and short-cut routine mill tests that have been developed and used in their mills. This program is part of the Ohio Section's projcet of assisting the national organization in bringing together a manual of special tests not at present being considered as official standard procedures.

Recent visitors to the United States have included: Col. Chadwick, Major Moore and Mr. Laidlaw of the Clyde Paper Mills, Rutherglen, Scotland, and Victor Robinson, President of Robinson & Sons, Ltd., England.

Peter J. Massey, formerly of the H. P. Smith Paper Company, is now general manager of the St. Regis Paper Company mill at Kalamazoo, Mich.

Vincent J. Mohan, formerly with F. H. Levey Company, is now in the Technical Service Division of E. I. du Pont de Nemours & Company, 256 Vanderpool Street, Newark, N. J.

Anton M. Lund is now vice president of the Hudson Pulp & Paper Company, Augusta, Maine.

W. L. Campbell has retired from Draper Bros. Company and is now located aat 802 So. Vine Street, Denver, Colo.

John Evans, formerly technical assistant to the Canadian Pulp and Paper Association is now control superintendent for the Brompton Pulp & Paper Company, Ltd., Red Rock, Ont.

Charles L. Corpening, formerly of the U. S. Army, is now in the paper research department of the Monsanto Chemical Company, Everett, Mass.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1946		Corresponding Weeks—1945	
October 12	105.9	October 13	96.2
October 19	105.1	October 20	96.5
October 26	106.8	October 27	95.8
November 2	107.2	November 3	97.5
November 9	106.8	November 10	97.0
November 16	*104.9*	November 17	96.4

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Av.
1945	86.7	89.4	90.2	88.1	89.8	91.2	80.8	88.6	90.2	95.9	95.5	91.0	89.7
1946	94.7	98.4	104.4	102.7	100.7	104.6	94.0	104.7	101.3	*106.4*			

COMPARATIVE YEARLY SUMMARIES

	1939	1940	1941	1942	1943	1944	1945	1946
Year to Date	82.2	86.1	96.8	91.7	88.4	88.5	89.4	*101.3*
Year average	83.4	85.6	97.4	90.4	87.8	88.1	89.7	

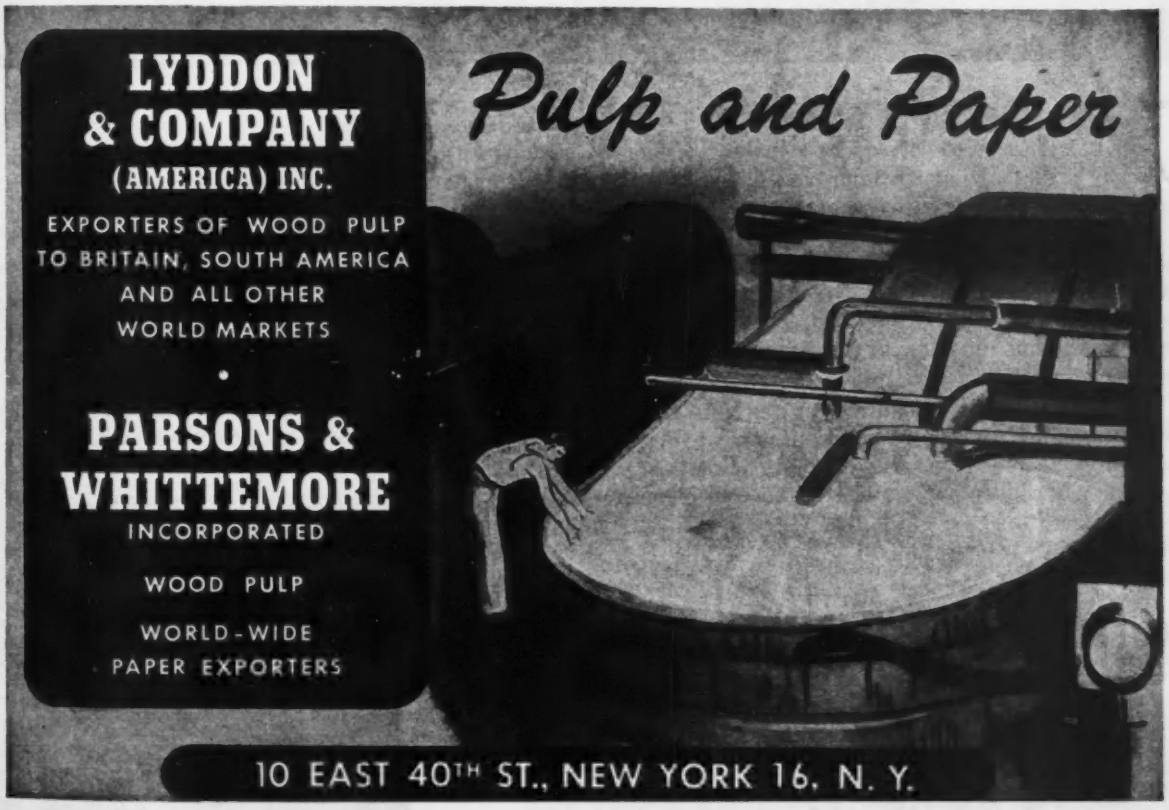
* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

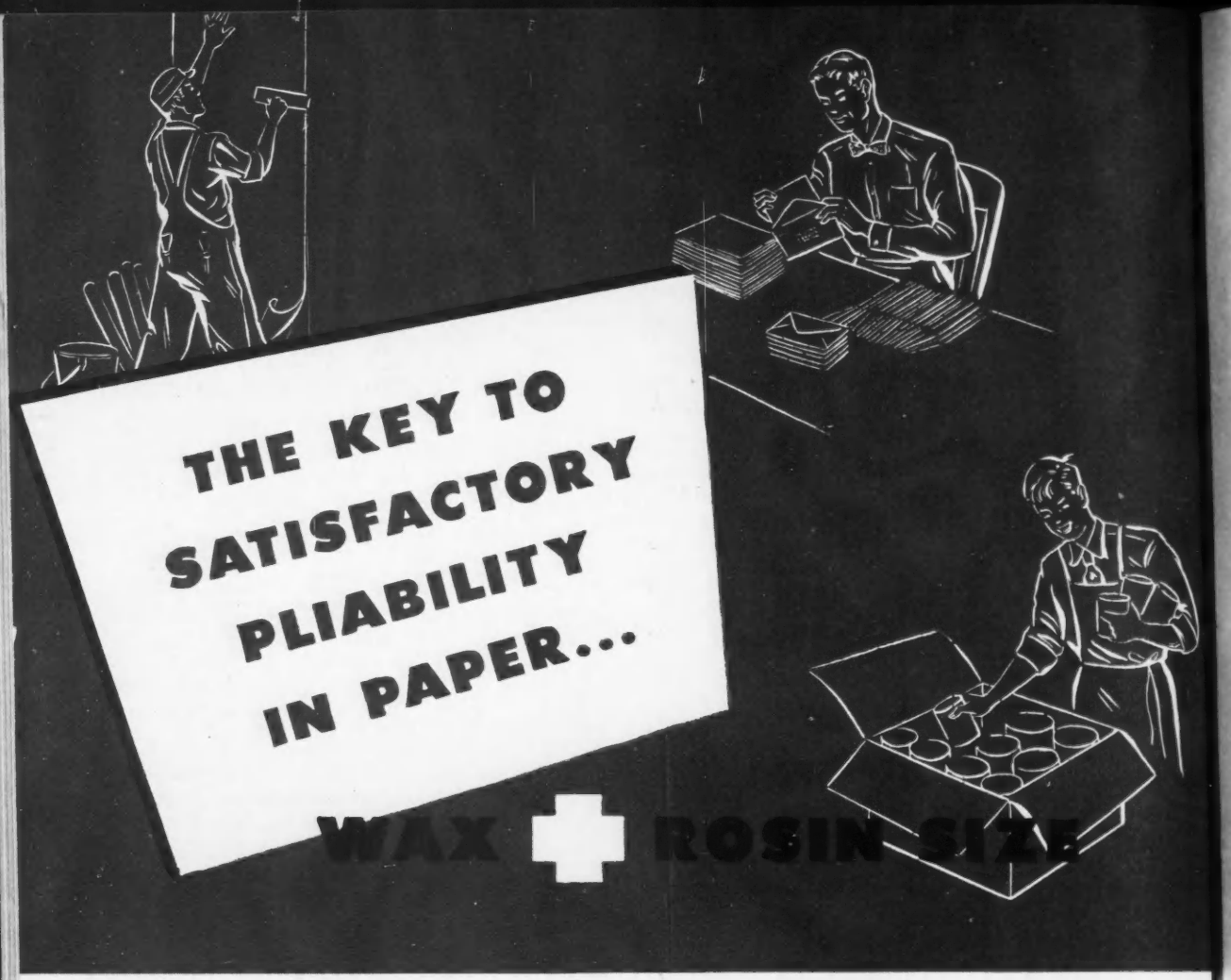
PAPERBOARD OPERATING RATIOS†

Current Weeks—1946		Corresponding Weeks—1945	
October 12	99	October 13	97
October 19	98	October 20	96
October 26	101	October 27	98
November 2	100	November 3	97
November 9	102	November 10	97
November 16	*101*	November 17	95

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1945	91	95	97	97	96	96	86	90	91	97	95	85	93
1946	90	97	100	99	94	97	89	99	96	*100*			

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.





THE USE of wax size with rosin size makes it economically possible to attain improved pliability without sacrificing other essential characteristics of paper.

Wax sizes offset the tendency of paper to crack and break due to loss in moisture content, thereby improving the creasing, scoring, folding, and crimping qualities of paper and paper board. This is especially important at this time of year when indoor humidities are generally low.

The addition of small quantities of wax size—one to two tenths of one per cent—is sufficient to secure appreciable improvement wherever pliability is necessary. It imparts flexibility and water resistance to hanging papers, resistance to scratch of pen and spread of ink to writing papers, better folding properties to envelope and writing papers. Box boards and die pressed products handle and shape more readily when wax is used as a plasticizer in the sizing operation. The wax size also gives greater water resistance at folded edges and corners.

If you have a technical problem concerning pliability, Cyanamid will be glad to work with you in determining the proper grade and percentage of wax and rosin sizes required in relation to the paper and methods of mill operation. We shall also be glad to consult with you on other applications of chemicals for paper treatment.

WHEN PERFORMANCE COUNTS... CALL ON CYANAMID

AMERICAN Cyanamid COMPANY

Industrial Chemicals Division

30 ROCKEFELLER PLAZA · NEW YORK 20, N. Y.

DISTRICT OFFICES: Boston, Massachusetts; Philadelphia, Pennsylvania; Baltimore, Maryland; Charlotte, North Carolina; Cleveland, Ohio; Chicago, Illinois; Kalamazoo, Michigan; Detroit, Michigan; St. Louis, Missouri; Azusa, California; Seattle, Washington. In Canada: Dillons Chemical Company, Ltd., Montreal and Toronto.

Section of the
TECHNICAL ASSOCIATION
OF THE PULP & PAPER INDUSTRY
122 E. 42nd St., New York 17, N. Y.
Edited by R. G. Macdonald, Secretary

The Rapid Measurement of an Index of Fiber Length

Part II. Some Relationships of the Index to Pulp Properties and Indications of Its Use for Stock Preparation Control.

By R. de Montigny[1] and P. Zborowski[2]

Abstract

A single bleached sulphate pulp has been extensively studied and empirical relationships derived which show that, for a given pulp, bulk, and tearing strength are simple straight-line functions of fiber length index independent of slowness, but that bursting and tensile strengths are more complex properties involving both fiber length and slowness as measured by the Schopper-Riegler instrument. Exploratory work shows that these relationships are different for different types of pulp and that some may vary from pulp to pulp of the same type.

Preliminary work with the fiber length index method in mill practice confirms the laboratory findings of such relationships for a constant furnish and a first trial of dual control of both slowness and fiber length index gave definite reduction in the variations of paper quality.

In an earlier paper, the need for additional tools to allow more satisfactory control of stock preparation was discussed and a test method described which evidence indicated would provide a quantitative index of fiber length for a given type of pulp. Since, moreover, the method was sufficiently simple, rapid and precise for routine work, it was felt that it might prove useful in supplementing measurements of drainage characteristics to arrive at a rapid evaluation of stock quality.

Work was therefore undertaken to determine whether fiber length index could be related to the properties of pulp by the standard tests of bulk and of tearing, bursting, and tensile strengths made on handsheets. Much of the work was confined to a single pulp in order to eliminate one variable, that of the pulp itself. The pulp chosen, a bleached sulphate, was extensively studied over a wide range of beating conditions, and from the data secured it was possible to derive empirical relationships between fiber length index and Schopper - Riegler slowness on the one hand, and bulk, tear, burst and tensile on the other. Thus it was shown that very simple relationships existed between fiber length index and bulk and tearing strength which were independent of slowness, whereas bursting and tensile strengths were more complex properties involving both fiber length and slowness.

At this stage of the investigation, it would no doubt have been of academic interest to determine the relationships for a variety of other pulps and to study the effect of such factors as loading and sizing. However, the work was limited to a few exploratory experiments which served to show that the relationships were not identical for pulps of different types and to indicate that some might vary from pulp to pulp of the same type. It was thought of greater practical interest to transfer the investigation from the laboratory to the mill and to seek to determine whether the concordance between the variables under study could be confirmed; if so, the next logical step was to make an attempt to reduce variations in paper quality by a simultaneous control of both fiber length index and slowness instead of by slowness alone. At the present writing, only the beginning of this work can be reported. On one mill run, observations only were made; in spite of such foreign variables as machine operation factors and of lowered precision in sampling and testing, the laboratory findings were confirmed. On a succeeding run, an attempt was therefore made to control both slowness and fiber length; because of lack of experience in such dual control, the degree of uniformity which might have been hoped for was not achieved. However, definite reduction in paper quality variations was obtained and it is believed that with further practice considerable improvement may be brought about and that the fiber length index measurement may be of definite usefulness.

Experimental—Laboratory

Study of a Bleached Sulphate Pulp

All the pulp used in the first series of experiments was from a single bale of bleached sulphate pulp and was seasoned for several months before testing was begun. The pulp was then refined in a 12-pound laboratory beater and beating curves determined under nine different sets of beating conditions involving

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 25-28, 1946.
[1] Technical Director, Rolland Paper Co., Ltd., St. Jerome, P. Q.
[2] Research Physicist, Rolland Paper Co., Ltd., St. Jerome, P. Q.

TABLE I.—SUMMARY OF DATA ON A SINGLE BLEACHED SULPHATE PULP

Beating Conditions		Wet Tests		Tests on Handsheets											
				Bulk—V			Tear Ratio—T			Burst Factor—B			Breaking Length—M		
Cons. % m-f.	Roll Pressure, lb.	Slowness, ° S.R., S	Fiber Length Index, L	Obs.	Calculated from Equation 1	% Diff. from Obs.	Obs.	Calculated from Equation 2	% Diff. from Obs.	Obs.	Calculated from Equation 3	% Diff. from Obs.	Obs.	Calculated from Equation 4	% Diff. from Obs.
Unbeaten		13.5	2.73	1.74	1.72	1.1	1.95	1.95	0.0	14.7	...	...	2500	....	...
4.0	100	17	1.66	1.45	1.51	4.1	1.38	1.43	3.6	61.3	50.3	17.9	7420	....	...
		25.5	1.34	1.36	1.45	6.6	1.13	1.28	13.3	74.5	74.4	0.1	8850	9510	7.5
		44	1.06	1.33	1.40	5.3	1.03	1.15	11.7	75.5	77.4	2.5	9300	9660	3.6
		61	0.87	1.39	1.36	2.2	1.07	1.06	0.9	79.5	75.8	4.7	9880	9460	4.3
		71	0.75	1.30	1.34	3.1	0.98	1.00	2.0	76.1	74.1	2.6	9080	9230	1.7
4.0	200	15	1.89	1.54	1.56	1.3	1.93	1.55	19.7	39.3	...	...	5700	....	...
		21	1.17	1.42	1.42	0.0	1.21	1.20	0.8	51.2	58.7	14.6	7440	8040	8.1
		27	0.92	1.37	1.37	0.0	1.06	1.08	1.9	59.4	59.5	0.2	7860	8250	5.0
		49	0.59	1.28	1.31	2.3	0.94	0.93	1.1	63.6	60.6	4.7	8150	8230	1.0
		69	0.41	1.24	1.27	2.4	0.88	0.84	4.5	62.1	59.5	4.2	8310	8040	3.3
4.0	300	17	1.48	1.47	1.48	0.7	1.48	1.35	8.8	41.5	43.1	3.9	6450	....	...
		19.5	1.12	1.44	1.41	2.1	1.29	1.18	8.5	46.5	51.7	11.2	6750	7080	4.9
		32	0.63	1.31	1.32	0.8	0.98	0.95	3.1	56.0	52.9	5.5	8020	7660	4.5
		43	0.52	1.29	1.30	0.8	0.94	0.90	4.3	58.9	55.1	6.5	8240	7800	5.3
		55	0.43	1.27	1.28	0.8	0.91	0.85	6.6	61.0	56.2	7.9	8410	7830	6.9
		71	0.32	1.31	1.26	3.8	0.94	0.80	14.9	62.7	56.4	10.0	7050	7770	10.2
3.0	100	17.5	1.51	1.41	1.48	5.0	1.12	1.36	21.4	61.0	53.3	12.6	8020	....	...
		21	1.42	1.37	1.47	7.3	1.11	1.32	18.9	62.8	68.7	9.4	8250	8890	7.8
		34	1.13	1.32	1.41	6.8	1.06	1.18	11.3	64.9	74.3	14.5	8560	9480	10.7
		49.5	0.93	1.28	1.37	7.0	0.92	1.09	18.5	68.1	74.2	8.7	8830	9380	6.2
		70	0.74	1.19	1.34	12.6	0.87	1.00	14.9	72.5	72.9	0.6	9560	9180	4.0
3.0	200	15	1.76	1.52	1.53	0.7	1.53	1.48	3.3	50.6	...	...	6200	....	...
		22	0.92	1.37	1.37	0.0	1.07	1.08	0.9	52.4	51.2	2.3	7150	7480	4.6
		58	0.49	1.29	1.29	0.0	0.89	0.88	1.1	64.5	59.8	7.3	7260	8110	11.7
		78	0.29	1.25	1.25	0.0	0.72	0.79	9.7	56.0	57.0	1.8	6980	7780	11.5
		89	0.13	1.23	1.22	0.8	0.67	0.71	6.0	53.5	52.8	1.3	6860	7380	7.6
3.0	300	18	1.31	1.52	1.45	4.6	1.27	1.27	0.0	54.8	50.6	7.7	6860	....	...
		23	0.90	1.44	1.37	4.9	1.07	1.07	0.0	65.3	52.6	19.5	7480	7630	2.0
		39	0.58	1.32	1.31	0.8	0.86	0.92	7.0	66.5	55.5	16.5	7810	7850	0.5
		60	0.42	1.27	1.28	0.8	0.81	0.85	4.9	62.5	57.5	8.0	8210	7910	3.7
		76	0.27	1.20	1.25	4.2	0.75	0.78	4.0	60.1	55.3	8.0	7940	7680	3.3
2.0	100	15	1.93	1.53	1.57	2.6	1.59	1.57	1.3	46.3	...	...	6490	....	...
		18	1.52	1.44	1.49	3.5	1.29	1.37	6.2	65.2	59.0	9.5	7890	....	...
		26	1.18	1.38	1.42	2.9	1.13	1.20	6.2	70.4	68.6	2.6	9250	9020	2.5
		50.5	0.97	1.35	1.38	2.2	1.03	1.10	6.8	74.6	76.3	2.3	9420	9560	1.5
		69	0.78	1.31	1.34	2.3	0.96	1.02	6.3	75.2	74.5	0.9	9510	9300	2.2
2.0	200	16	1.69	1.52	1.52	0.0	1.43	1.45	1.4	46.5	...	...	6960	....	...
		24	0.94	1.37	1.38	0.7	0.98	1.09	11.2	61.2	55.9	8.7	8240	7940	3.6
		49	0.60	1.31	1.31	0.0	0.91	0.93	2.2	57.0	61.0	7.0	8530	8260	3.2
		71	0.39	1.23	1.27	3.3	0.75	0.83	10.7	60.6	59.2	2.3	7630	8010	5.0
2.0	300	17	1.38	1.48	1.46	1.3	1.42	1.30	8.5	44.8	39.1	12.7	6580	....	...
		22	0.92	1.42	1.37	3.5	1.09	1.08	0.9	53.7	51.2	4.7	7620	7480	1.8
		32	0.72	1.37	1.33	2.9	0.98	0.99	1.0	56.0	56.5	0.9	8180	7970	2.6
		44	0.58	1.31	1.31	0.0	0.89	0.92	3.4	56.5	58.2	3.0	8330	8030	3.6
		65	0.45	1.25	1.28	2.4	0.85	0.86	1.2	57.3	60.1	4.9	8310	7910	4.8
		77	0.33	1.19	1.26	5.9	0.79	0.80	1.3	51.4	58.2	13.2	7740	7890	1.9
						Av. 2.7			Av. 6.3			Av. 6.8			Av. 4.8

Equation 1 for bulk $V = 0.19\ L + 1.20$
Equation 2 for tear $T = 0.475\ L + 0.65$
Equation 3 for burst $B = 40\ L + 30 \log (S\text{-}16.5) - 7.1$
Equation 4 for breaking length $M = 3400\ L + 1970 \log (S\text{-}18.5) + 3280$

three consistencies and three loads on the roll. Five or six points were determined for each beating curve, fiber length index, Schopper-Riegler slowness, bulk, tear ratio, burst factor, and breaking length being measured at each point.

The data obtained are summarized in Table I.

From this data it was possible to derive the following relationships:

Bulk. All values of bulk plotted on basis of fiber length index, independently of slowness, fell on a single straight line (Fig. 1), whose equation was

$$V = 0.19\ L + 1.20$$

where V = bulk and L = fiber length index.

The values of bulk recalculated on the basis of the equation above agreed with experimentally determined values within an average difference of 2.7%.

Tear Ratio. All values of tear ratio plotted on a basis of fiber length index, independently of slowness, fell on a single straight line (Fig. 1) whose equation was

$$T = 0.475\ L + 0.65$$

where T = tear ratio and L = fiber length index.

The values of tear ratio recalculated on the basis of the equation above agreed with the experimentally determined values within an average difference of 6.3%.

Burst Factor. Since, in practically all beater runs, the values of burst factor went through a maximum, it was obvious that more than one factor was involved. Burst factor and fiber length index were therefore plotted against Schopper-Riegler slowness for each beater run and from the curves (not reproduced here) the values of burst factor and fiber length index corresponding to a number of fixed values of S. R. slowness read off. It was thus possible to draw a plot of burst factor *vs* fiber length index at constant slowness (Fig. 2). There was some scattering of points but it was possible to draw a series of parallel straight lines through the groups of points corresponding to single values of slowness. This gave a preliminary equation of the form:

$$B = 40\ L + C_B \text{ at constant slowness}$$

where B = burst factor and C_B = a function of slowness.

An examination of the variation of C_B with slowness showed that the relationship was:

$C_B = 30 \log (S\text{—}16.5) - 7.1$ where S = Schopper-Riegler slowness

thus completing the equation.

$$B = 40\ L + 30 \log (S - 16.5) - 7.1$$

The values of burst factor recalculated on the basis of the equation above agreed with the experimentally determined values within an average difference of 6.8%.

Breaking Length. The breaking length data responded to the same treatment as that for burst factor (Fig. 2) and gave the equation:

$$M = 3400\ L + 1970 \log (S - 18.5) + 3280$$

where M = breaking length, L = fiber length index and S = Schopper-Riegler slowness.

The values of breaking length recalculated on the basis of the equation above agreed with the experimentally determined values within an average difference of 4.8%.

Exploratory Work With the Other Pulps

Five bleached sulphite pulps, each from a different mill, one rag pulp and one soda pulp were next beaten at a single consistency and roll pressure and the same tests made as with the bleached sulphate previously. The data are summarized in Table II.

Plots were drawn of bulk *vs* fiber length index (Fig. 3) and tear ratio *vs* fiber length index (Fig. 4).

The data on bulk indicate that although bulk remains a straight-line function of fiber length index for all pulps, with the possible exception of soda, bulk appears to be a highly specific property and the position of the line shifts from pulp to pulp even amongst the group of bleached sulphites.

The data on tear ratio indicate not only that the straight-line relationship between tear ratio and the fiber length index applies to pulps other than the bleached sulphate studied but that the relationship appears to be constant for pulp of a given type inasmuch as the points for all five bleached sulphites fall substantially on the same straight line.

Because of the complex nature of the relationships between burst factor and breaking length on the one hand and fiber length index and Schopper-Riegler slowness on the other, no attempt was made to analyse the small amount of data available and the question remains open whether such relationships are constant for pulps of a given type or vary from pulp to pulp within the same type.

TABLE II.—SUMMARY OF DATA ON VARIOUS PULPS

Fiber Length Index	Slowness, ° S.R.	Bulk, cc./g.	Burst Factor	Tear Ratio	Breaking Length (*M*)
		Bleached Sulphite 1			
2.25	11.5	1.72	8.1	1.11	1970
1.65	13	1.57	14.9	1.40	3130
1.14	18.5	1.41	31.3	1.01	5070
0.87	29	1.36	36.7	0.86	6170
0.73	37.5	1.33	45.4	0.81	6890
0.62	52.5	1.31	48.7	0.78	7570
0.46	74	1.29	43.8	0.67	6990
		Bleached Sulphite 2			
2.03	14	1.72	10.7	1.52	2760
1.50	15	1.55	20.0	1.30	4080
1.05	17	1.44	31.8	0.96	5560
0.86	24	1.35	37.2	0.81	6420
0.67	36	1.29	40.6	0.68	7310
0.44	60.5	1.24	43.8	0.61	7670
0.32	74	1.16	42.0	0.53	7340
		Bleached Sulphite 3			
2.21	13	1.84	8.7	1.34	2440
1.50	13.5	1.67	20.2	1.23	4280
1.00	20	1.51	30.4	1.00	5580
0.74	26	1.39	37.4	0.81	6360
0.62	37	1.34	42.3	0.71	6810
0.48	51	1.31	44.3	0.66	7060
0.35	70	1.28	38.5	0.57	6740
		Bleached Sulphite 4			
2.03	13.5	1.84	11.1	1.55	2390
1.41	14	1.56	29.6	1.42	4780
0.90	20	1.45	36.1	0.94	6260
0.70	31	1.41	42.7	0.79	7040
0.54	43	1.37	44.7	0.69	7420
0.47	59.5	1.29	46.5	0.59	7680
0.28	78	1.24	45.6	0.56	7890
		Bleached Sulphite 5			
1.49	14	1.75	16.8	0.99	4580
0.98	17	1.56	27.4	0.80	5580
0.68	27.5	1.47	33.8	0.67	6490
0.48	42	1.35	36.2	0.70	7030
0.35	56	1.28	35.8	0.53	6840
0.24	70	1.24	31.5	0.44	6550
0.095	83.5	1.22	23.1	0.41	5510
		Rags			
3.02	18	1.91	17.5	2.85	2700
2.10	24	1.82	21.7	2.91	3760
1.72	29	1.78	26.4	3.24	4340
1.38	36	1.65	29.8	2.84	4750
1.10	49	1.59	33.6	2.70	5010
0.29	70.5	1.49	35.3	1.55	5380
		Bleached Soda			
0.201	17.5	1.82	9.5	0.48	2580
0.139	19.5	1.75	13.6	0.57	3260
0.075	29.5	1.56	20.5	0.50	4170
0.073	36	1.50	21.4	0.58	4460
0.056	45.5	1.41	23.9	0.62	4550
0.046	59.5	1.35	26.3	0.71	4690
0.039	72	1.28	26.8	0.75	4910

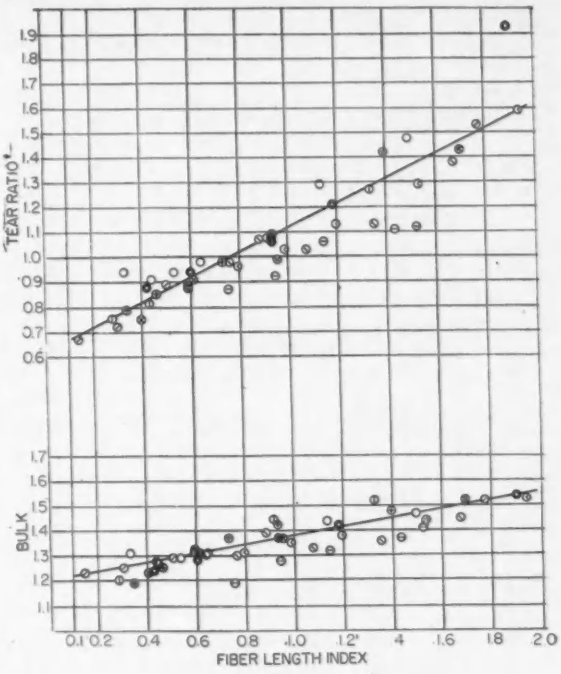


FIG. 1

Relation Between Fiber Length Index, Bulk and Tear Ratio for a Bleached Sulphate Pulp

Discussion of Laboratory Results

It is fully realized that the work reported above represents only a very sketchy investigation of the relationships between the variables under study. However, to have extended this phase of the work to cover several types of pulp and sufficient different samples of each type, then to include various kinds and amounts of loading and sizing materials, would have consumed a large amount of time which the authors could ill afford under present circumstances. Moreover, it was doubted that such an exhaustive study would yield data which would be of significant additional value in its practical application since it was never expected or intended that the quantitative relationships would be made use of as such in practice. The primary aim was to determine whether or not fiber length index were related to the papermaking properties of pulp. The fact that such relationships did exist having been definitely established under laboratory conditions, it was decided to immediately transfer the investigation to the mill in order to observe whether relationships of the type found could be confirmed under operating conditions when dealing with reasonably constant although mixed furnish and, if so, to attempt to put the fiber length index test method to practical use as a means of stock preparation control in conjunction with Schopper-Riegler slowness.

The beginning of this practical work is described below.

Experimental—Mill

Observation

A 36-hour run of 25% rag paper was followed by means of hourly tests of Schopper-Riegler slowness

TABLE III.—SUMMARY OF DATA FOR MACHINE RUN ON 100% RAG PAPER

Day	Hour	Beaters °S.R.	Beaters F.L.I.	Jordan °S.R.	Jordan F.L.I.	Machine °S.R.	Machine F.L.I.	Physical Tests on Paper: Weight, g./m.²	Burst Factor	% Diff. from Av.	Tear Factor, Mach. Dir.	% Diff. from Av.	Tear Factor, Cross-Dir.	% Diff. from Av.	Bulk, cc./g.	% Diff. from Av.	Air-resist Gurley secs./100 cc.	% Diff. from Av.	Remarks
Thursday	9 PM	54.5	0.69																
	10			60	0.54														
	11	53.5	0.69																
Friday	12 MN			60.5	0.49	57	0.54	85.8	23.9	4.2	1.17	2.5	1.35	3.8	1.61	1.9	110	3.5	
	1	51.5	0.53					87.7	23.3	1.7	1.28	6.7	1.32	1.5	1.52	3.8	133	16.8	
	2			60.5	0.43	59.5	0.52	82.6	23.5	2.6	1.31	9.2	1.33	2.3	1.55	1.9	119	4.4	
	3	48	0.79					83.2	22.1	3.5	1.26	5.0	1.29	0.8	1.57	0.6	114	0.0	
	4			56.5	0.58	57	0.57	83.5	22.3	2.6	1.25	4.2	1.40	7.7	1.59	0.6	82	28.1	
	5	41	0.99					84.5	24.1	5.2	1.14	5.0	1.33	2.3	1.59	0.6	112	1.8	
	6			51	0.68	53	0.65	85.4	21.2	7.4	1.14	5.0	1.36	4.6	1.61	1.9	72	36.8	
	7	...	...					79.2	20.8	9.2	1.21	0.8	1.36	4.6	1.65	4.4	60	47.3	
	8			50	0.76	49.5	0.76	86.0	22.7	0.9	1.31	9.2	1.44	10.8	1.66	5.1	63	44.7	
	9	...	...					81.5	21.4	6.5	1.33	10.8	1.39	6.9	1.66	5.1	62	45.6	
	10			56.5	0.61	53	0.74	84.7	23.4	2.2	1.28	6.7	1.35	3.8	1.66	5.1	60	47.3	
	11							SHUT-DOWN											
	12 Noon	52.5	0.69	57	0.66	55	0.74	83.7	23.2	1.3	1.29	7.5	1.41	8.5	1.63	3.2	80	29.8	
	1							84.1	22.5	1.7	1.24	3.3	1.38	6.2	1.62	2.5	82	28.1	
	2	54	0.55	59	0.51	55	0.64	84.8	22.7	0.9	1.17	2.5	1.38	6.2	1.62	2.5	96	15.8	
	3							84.5	22.1	3.5	1.29	7.5	1.34	3.1	1.60	1.3	94	17.5	
	4	49	0.83	60.5	0.46	57	0.55	86.5	23.5	2.6	1.24	3.3	1.33	2.3	1.56	1.3	103	7.9	Uncontrolled portion of run
	5							85.0	22.7	0.9	1.13	5.8	1.25	3.8	1.55	1.9	128	12.3	
	6			61	0.50	57.5	0.54	84.1	23.4	2.2	1.26	5.0	1.29	0.8	1.55	1.9	124	8.8	
	6:30	48	0.73					86.5	21.5	6.1	1.06	11.7	1.26	3.1	1.54	2.5	116	1.8	
	7																		
	8			57	0.51	56.5	0.52	83.7	22.3	2.6	1.23	5.1	1.24	0.8	1.55	1.9	100	8.7	
	8:30	50	0.76																
	9							87.1	24.0	4.8	1.15	1.7	1.21	3.2	1.59	0.6	104	13.0	
	10			58.5	0.49	57	0.56	86.2	22.8	0.4	1.20	2.6	1.33	6.4	1.59	0.6	104	13.0	
	10:30	54.5	0.78																
	11							84.3	23.2	1.3	1.16	0.9	1.20	4.0	1.58	0.0	100	8.7	
Saturday	12 MN	49	0.79	57.5	0.61	56.5	0.63	83.0	22.8	0.4	1.11	5.1	1.23	2.4	1.59	0.6	118	28.3	
	1							80.7	22.5	1.8	1.14	2.6	1.26	4.8	1.62	2.5	108	17.4	
	2	56	0.66	60.5	0.58	56.5	0.68	82.4	21.8	4.8	1.13	3.4	1.21	3.2	1.61	1.9	100	8.7	
	3							88.8	21.5	6.1	1.22	4.3	1.34	7.2	1.56	1.3	104	13.0	
	4			59	0.62	56.5	0.64	85.6	22.0	4.0	1.23	5.1	1.35	8.0	1.57	0.6	108	17.4	
	4:30	48.5	0.86																
	5							86.9	22.9	0.0	1.14	2.6	1.17	6.4	1.59	0.6	94	2.2	
	6			57	0.66	55.5	0.69	86.2	22.4	2.2	1.21	3.4	1.23	1.6	1.62	2.5	80	13.0	
	7							86.2	22.9	0.0	1.22	4.3	1.30	4.0	1.58	0.0	80	13.0	
	7:30	49	0.72																
	8			60.5	0.50	57	0.67	85.2	23.7	3.5	1.20	2.6	1.35	8.0	1.57	0.6	100	8.7	
	9	48.5	0.74					85.1	22.7	0.9	1.10	6.0	1.18	5.6	1.55	1.9	122	32.6	
	10			60.5	0.53	59	0.55	83.5	24.1	5.3	1.10	6.0	1.27	1.6	1.57	0.6	105	14.1	Controlled portion of run
	11	51	0.66																
	11:30							83.9	23.6	3.1	1.17	0.0	1.26	0.8	1.59	0.6	117	27.2	
	12 Noon			66	0.43	62	0.54	84.1	23.9	4.9	1.13	3.4	1.21	3.2	1.59	0.6	124	34.8	
	1							86.7	23.4	2.2	1.10	8.3	1.20	7.7	1.57	0.6	146	28.0	
	1:30	53	0.70																
	2			66	0.49	62.5	0.48	85.2	23.9	4.4	1.13	5.8	1.20	7.7	1.58	0.0	152	33.3	
	3							84.9	23.9	4.4	1.13	5.8	1.15	11.5	1.54	2.5	140	22.8	
	4			68	0.44	64	0.49	83.5	24.5	7.0	1.10	8.3	1.13	13.1	1.56	1.3	160	40.3	
	4:30	66	0.71																
	5							89.5	23.2	1.3	1.16	3.3	1.18	9.2	1.52	3.8	158	38.9	
	6			67	0.43	66	0.46	88.8	22.0	3.9	1.10	8.3	1.13	13.1	1.52	3.8	168	47.3	
	6:30	59.5	0.71																
	7							87.7	23.8	3.9	1.19	0.8	1.21	6.9	1.54	2.5	148	29.8	
	8	47	0.79	64	0.53	64	0.54	84.5	22.6	1.3	1.18	1.7	1.28	0.8	1.53	3.2	140	22.8	
	9							83.7	24.2	5.7	1.24	3.3	1.30	0.0	1.55	1.9	116	1.8	
	10							82.0	24.3	6.1	1.18	1.7	1.24	4.6	1.57	0.6	184	61.4	
							Averages—Controlled		**22.9**	**2.71**	**1.17**	**3.11**	1.25	3.75	1.58	1.02	92	14.4	Uncontrolled portion of run
							Uncontrolled		22.9	3.64	1.20	5.48	1.30	5.44	1.58	2.35	114	25.0	

and fiber length index on the machine head-box stock and of basis weight, bulk, tear ratio, and bursting strength on the paper before tub-sizing or calendering. The observations are shown in Fig. 5.

It is obvious that there is marked parallelism between the plots of fiber length index, tear ratio, and bulk. This correspondance has been further confirmed by replotting tear and bulk *vs* fiber length index in Fig. 6, where, in spite of some scattering of points which is not unexpected in view of the influence of machine operation factors which are independent of stock quality, the trend of straight line increase of both tear and bulk with increase in fiber length index is confirmed.

Interpretation of the plot of burst factor is a little more difficult but it can be seen that both fiber length and slowness influence the burst factor. Attention is drawn to the portion of the plot between 1 P.M. to Midnight Friday where fiber length index and slowness varied quite widely in opposite directions but during which burst factor remained practically constant.

Control Trial

The observations reported above having shown that fiber length index of the stock did bear a relation to paper qualities when dealing with mixed furnish under machine operating conditions, an attempt was made to make use of the fiber length index test to control stock quality in conjunction with Schopper-Riegler slowness. A run of 100% rag paper was chosen for the trial.

The run was allowed to proceed for 20 hours without any attempt at control of fiber length index. During this period measurements were made of fiber length index and slowness on each beater dropped and every 2 hours at the jordan and machine head-box.

Then followed a period of 17 hours during which it was endeavoured to drop the beaters at as uniform a fiber length index and slowness as possible. Control was attempted only at the beaters, a request being made to the machine crews to vary the jordan setting only if indispensable; actually the jordan setting was changed only twice to compensate for changes in the quantity of trim returning from the couch-pit. Testing was continued as before.

The trial was concluded with a 9-hour period during which no further attempt was made at control.

The data collected are reported in Table III.

The paper test figures were divided into two groups, one comprising the two uncontrolled portions at the beginning and end of the run, the other the middle portion during which control was attempted. Averages were calculated for each group as well as percentage differences between hourly figures and the appropriate average.

Because of lack of experience with such dual control of slowness and fiber length index simultaneously, the uniformity achieved was not what might have been desired. In spite of this, it is seen that the variations in all three paper properties in which improvement was looked for, namely bulk, tear, and burst, were definitely smaller during the controlled than during the uncontrolled portion of the run. A property such as air resistance to which the relationship of fiber length index and slowness were unknown, also showed definitely less variation.

Discussion of Mill Trials

At the present writing, only the two runs on which data are reported above have been studied by means of the fiber length index test method. However, the authors feel confident that even such limited data justify entertaining hope that the method can prove useful in routine practice. It is obvious that considerable experience will be required before full use can be made of the method.

In the first place, operators will have to learn how to manipulate their refining equipment in order to control satisfactorily and simultaneously two independent variables instead of a single one.

In the second place, since the relationships between

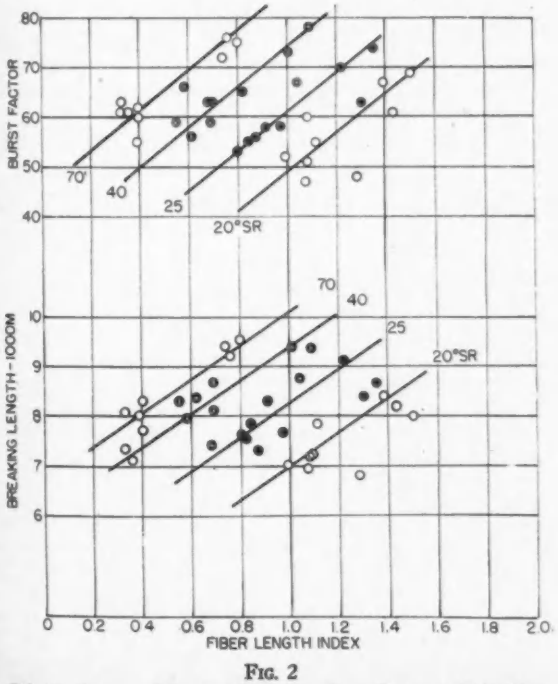


Fig. 2

Relation Between Fiber Length Index, Burst Factor and Breaking Length at Constant Schopper-Riegler Slowness for a Bleached Sulphate Pulp

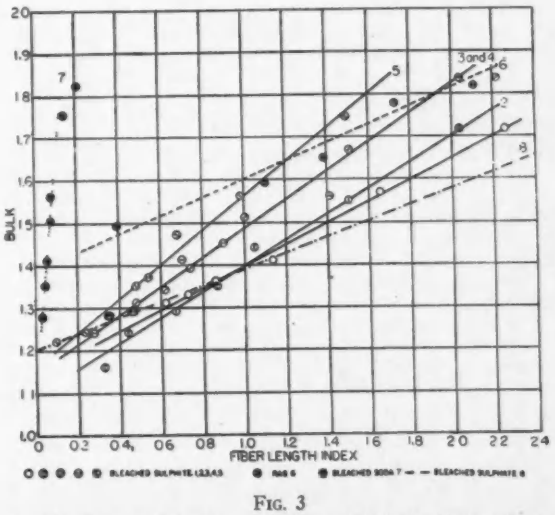


Fig. 3

Relation Between Fiber Length Index and Bulk for Various Pulps. 1 to 5—Bleached Sulphites. 6—Rag. 7—Bleached Soda. 8—Bleached Sulphate (from Fig. 1)

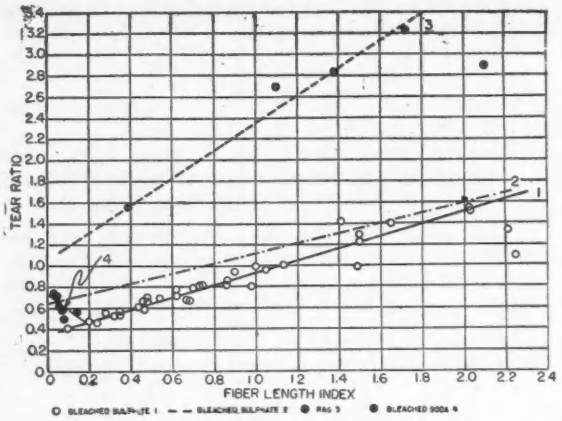


FIG. 4

Relation Between Fiber Length Index and Tear Ratio for Various Pulps. 1—Bleached Sulphites. 2—Bleached Sulphate (from Fig. 1). 3—Rag. 4—Bleached Soda

fiber length index, slowness and papermaking properties are not universal but vary with different furnishes it is obvious that a period of observation is required before standards of fiber length index can be established for different grades of paper involving different furnishes to arrive at the desired paper properties. This need for calibrating the method may appear to detract from its usefulness. However, the case is very similar to that of drainage-rate measurements where it is known that the same test result for different furnishes does not necessarily mean the same running quality of the stock on the wire; the fact that a very similar calibration is required in the case of drainage measurements has not prevented the method from being widely used. The remarks above apply equally well to daily or seasonal variations which may occur in the same type of pulp either in an integrated mill or in a mill using purchased pulp, where adjustment of drainage-rate measurement standards must occasionally be made to compensate for raw material variations. In other words it is expected that much of the same advantages and shortcomings which attach to drainage-rate measurements

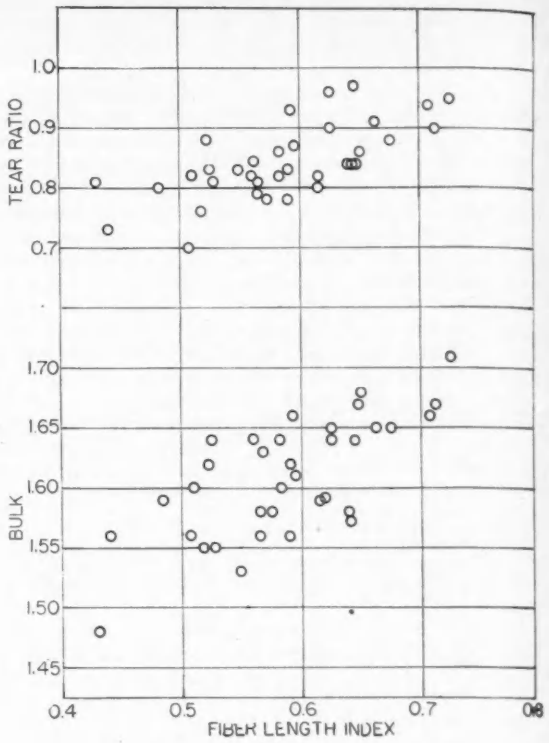


FIG. 6

Relation Between Fiber Length Index, Bulk and Tear Ratio for Machine Run of 25% Rag Paper

will apply to fiber length index. None the less, it is also felt that simultaneous use of both tests may well offer a means of more accurate control than is possible at present.

Acknowledgement

The writers are greatly indebted to the Pulp and Paper Research Institute of Canada, members of whose staff carried out all the physical tests on handsheets reported above.

FIG. 5

Summary of Observations on Machine Run of 25% Rag Paper

Tall Oil from the Consumer's Viewpoint*

By Leonard Byman[1]

Abstract

A recent market survey of representative consumers indicates a trend toward diversified applications of tall oil and its derivatives. War-time shortages of raw materials have accelerated research and development in many industries requiring fats, oils, and rosin.

Significant advances in the substitution of tall oil for vegetable and animal fats have been made. Producers of soaps, textile detergents, degreasing compounds, paints, varnishes, resins, driers, metal-cutting compounds, disinfectants, fungicides, printing inks, and emulsifiers have developed new formulas and processes for the adaptation of tall oil. Consumers' opinions under present conditions and for the near future have been analyzed and summarized. The position of tall oil when stocks of fats, oils, and rosin are more abundant is suggested from the viewpoint of the industrial user.

Physical and chemical characteristics, uniformity of composition, and minor constituents are shown as factors of importance. New developments in the fractionation of tall oil and the use of chemical derivatives are discussed.

The recovery and utilization of American tall oils have been greatly stimulated by the shortage of common fats and oils and of rosin, created by wartime restrictions in imports, diversion of domestic products, and tremendously increased demands for military needs. Governmental measures in the recent past have directed a large part of tall-oil volume in substitution for red oil and naphthenic acids to insure the continued production of varnish driers, cutting oils, drawing compounds, special solvents and lubricants, core oils, emulsifying agents, and the like, resulting in a temporary curtailment of the flow of tall oil to manufacturers of soap, paint, and linoleum.

A survey of 48 consumers of tall oil, together with an examination of the pertinent literature, has provided information of value in judging the position of tall oil and its derivatives under more stable market conditions.

Tall Oil Versus Competitive Materials

Production

An estimate *(61, 104)* of the Department of Agriculture places the volume of refined tall oil produced during the period, April, 1944-March, 1945, at about 35,000 tons. Other related and more recent data for the volume of black liquor soap produced, black liquor soap acidified, and crude tall oil reported are given in Table I.

The total production of sulphate pulp in the United States has been reported as approximately 4,600,000 tons per year for 23 companies. This estimate compares favorably with that of 4,800,000 tons mentioned by Wise *(110)*. With an estimated yield of 150 pounds of skimmings (black liquor soap) per ton of sulphate pulp, a potential annual production of 350,000 tons of skimmings might be expected, giving with good industrial practice, 175,000 tons of crude tall oil. If all the crude tall oil possible were converted to a refined product, as much as 130,000 tons might be available for marketing each year, while roughly 75,000 tons of refined tall oil might be expected with a continuance of the present distribution between sales of the crude and refined product. This potential volume of refined tall oil is comparable with the quantities of vegetable and animal fats, aside from linseed and coconut oils, and tallow, consumed for nonfood uses in normal periods.

The statistics listed in Table II represent the distribution over the principal markets for the fats and oils produced in largest quantities in 1940. The preponderance of animal tallows and coconut oil for soap-making, and of linseed oil for paints and varnishes is easily seen.

In the past years, the total production of rosin in the United States, from both gum and wood sources, has amounted to 700 to 800 million pounds annually. Most recently, the distribution of rosin among the principal consumers has included 25% for paper and paper size, 21% for soap, 17% for chemicals and pharmaceuticals, 16% for ester gum and synthetic resins, and 9% for paint and varnish *(61)*. The high proportion of rosin production directed to the manufacture of soap corresponds to approximately 5% of the weight of fats and oils consumed in soap making *(9)*.

Market Prices

The statistics given in Table III for the average prices of common fats and oils over the period, 1936-1945, are to be compared with the stabilized quotations of 2 to 3 cents per pound for crude tall oil and 4 to 5 cents per pound for refined tall oil. The parallel trend of prices, particularly in the soap-making group of fats, is indicative of the competitive position of each fat relative to other members of its group *(23)*. The influences of wartime shortages and governmental controls are shown after 1940. The greater value of the drying-oil group and the effect of drastic shortages in supply are shown by the prices for the paint and varnish oils. Commercially refined fatty acids are sold at prices 40 to 50% greater than the quotations for the base fats at the present time.

The average price of rosin has risen from 2 cents per pound in 1940, to the present quotation of 5 to 7 cents per pound. This price level is expected to hold for the next few years because of increasing demand, restricted sources of supply, and higher wage scales.

Average Characteristics

The comparative analyses of refined tall oils given in Table IV include the significant specifications of the products of three companies. The variations in such characteristics as viscosity and relative content of fatty and rosin acids may be attributed to differences in raw materials and refining processes.

TABLE I.—PRODUCTION OF TALL OIL
Estimate of U. S. Department of Agriculture (*61, 104*)

	April, 1945-March, 1946, (Projected)* tons	April, 1944-March, 1945, tons	April, 1943-March, 1944, tons
Black liquor soap produced	206,000	197,437	173,535
Black liquor soap acidified..	201,000	162,354	140,049
Crude tall oil reported.....	98,000	80,060	70,427
Refined tall oil estimated..	.....	35,000	.....

* Estimated from the statistics reported for the 9-month period, April-December, 1945.

* Presented at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 25-28, 1946.

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A similar summary of the average characteristics of the major vegetable and animal fats is shown in Table V. In comparing these data with the related values for refined tall oils given in Table IV, certain significant points are apparent. The oils of greatest value in soap making have low iodine values (with correspondingly low proportions of unsaturated fatty acids) and high saponification values with less than 1% unsaponifiable matter. The oils most used for paint and varnish making have high iodine values, less than 2% unsaponifiable matter, and low acid numbers.

Refined tall oil is characterized by acid numbers approximately equal to saponification numbers in the range, 160 to 180, values somewhat lower than those for all the common fats and oils. The iodine number (150 to 170) approaches the values reported for linseed oil. Refined tall oil, with reported contents of unsaponifiable constituents varying from 6 to 10%, differs markedly in this respect from all the common fats and oils.

Composition

The composition of fatty acids in domestic tall oils is shown in Table VI, as determined by several investigators. The variations in percentages of the principal constituents are pronounced, but a comparison indicates the preponderance of linoleic and oleic acids.

Tall oil as a soap-making constituent may be considered a general competitor of fats and oils of the lauric acid group (coconut, palm kernel, and babassu), the animal fat group (lard and tallow), and the marine oil group. Inedible grades of cottonseed, peanut, and olive oils, and palm oil, which may all be classified in the oleic-linoleic acid group, are also used chiefly for soap manufacture. In its use in paint vehicles, tall oil is a replacement for linseed and soybean oils of the linolenic-acid group and for tung, oiticica, and dehydrated castor oil of the conjugated-acid group.

The major constituents of the common fats and oils, used in the United States chiefly for the production of soaps and paints, are listed in Table VII. The groups shown may serve to classify roughly the fats and oils according to principal components and use. The fatty-acid fraction of tall oil resembles most closely the vegetable oils of the oleic-linoleic acid group.

Tall-Oil Markets

Established Markets

At the present market price of tall oil, its consumption is assured in the manufacture of yellow laundry soaps, textile soaps *(48)*, scouring compounds, and industrial detergents *(86)*. The penalty imposed by soap-makers on tall oil generally consists in giving credit to either the fatty-acid components or the rosin acid constituents, not to both. The margin of cost when comparing refined tall oil with the common fats and oils used in soap-making, or more exactly with the corresponding fatty acids, is thus greatly reduced.

TABLE II.—CONSUMPTION OF PRINCIPAL FATS AND OILS IN THE UNITED STATES—1940 *(105)*
Millions of Pounds (Other Than Food Uses)

Fat or Oil	Soap	Paints and Varnishes	Miscellaneous Products
Tallow	1040	...	194
Coconut	485	...	...
Marine	113	46	76
Palm	101	...	...
Cottonseed	79	...	...
Babassu	47	...	...
Soybean	44	43	19
Linseed	....	568	13
Tung	....	67	...
Castor	....	41	47
Perilla	....	19	...
Oiticica	....	16	...
Rapeseed	....	...	13
Tall oil (refined)		70 (All uses)	

TABLE III.—AVERAGE PRICES OF COMMON FATS AND OILS—1936-45 (9)
(Cents per pound)

	Lauric-Acid Group and Animal Fats (Soapmaking)			
	Coconut	Palm Kernel	Babassu	Tallow
1936	8	8	..	6
1937	9	9	..	8
1938	6	7	..	5
1939	6	7	..	5
1940	6	..	..	4
1941	8	..	..	7
1942	11	11	11	8
1943	8	8	..	8
1944	8	9	..	..
1945	9	9	11	9

	Oleic-Linoleic Acid Group (Soapmaking)			
	Cottonseed	Peanut	Olive (Foots)	Palm
1936	9	9	9	8
1937	8	8	11	9
1938	7	7	8	7
1939	6	6	8	7
1940	5	6	9	7
1941	10	10	15	10
1942	13	13	19	12
1943	..	13	..	8
1944	..	13	..	..
1945	8	8	18	9

	Linolenic and Conjugated-Acid Groups (Paints and Varnishes)				
	Linseed	Soybean	Perilla	Tung	Oiticica
1936	10	8	9	16	13
1937	10	8	12	16	13
1938	9	6	10	14	11
1939	9	5	12	21	15
1940	9	5	19	26	19
1941	10	9	20	32	20
1942	12	12	25	39	25
1943	15	11	25	39	25
1944	15	11	..	39	20
1945	15	8	..	39	24

However, the competitive position of tall oil in this large field remains quite sound, particularly with the return to more uniform and improved tall oil refined under less urgent conditions.

Refined tall oil is expected by a large proportion of the paint industry to be permanently established as an extender of drying oils in lower-cost paints, especially for interior use *(5)*. In this connection, a developing market for tall oil is expected for the formulation of low-priced enamels, water-miscible paints, alkyd resins, and certain floor coverings and insulating materials. The emulsifying qualities of tall oil insure a continued large demand for low-grade and crude tall oil in ore-flotation agents and asphalt-emulsifying compounds.

Questionable Markets

In spite of the acceptance of refined tall oil by many varnish-drier formulators, the use of tallates as substitutes for naphthenate driers has already fallen off, with increasing production of naphthenic acids *(104)*. The better stability, higher metal content, lower viscosity, and general working properties of naphthenate driers as compared with tallates are believed to compensate to a considerable extent for the increased cost of raw material (with naphthenic acid selling at 10 to 12 cents per pound). However, improvement in stability of refined tall oil toward heat and oxidation and in uniformity of composition may influence a considerable number of varnish formulators toward acceptance of refined tall oil. The promotion of pen-

TABLE IV.—COMPARATIVE ANALYSES OF REFINED TALL OILS *(35, 56, 103)*

Specifications	A	B	C
Iodine No., Wijs	160–170	.....	149
Saponification No.	165–175	170–185	174
Unsaponifiable constituents, %	6–7	6–10	8
Titre, °C.	.....	.....	6
Pour point, °C.	7–13	.....	4
Acid No.	155–165	170–180	164
Rosin acids No.	85–95	63–71	...
Fatty acids, %	43–47	55–60	53
Rosin acids (abietic), %	46–50	34–38	39
Viscosity, S.S.U. at 210° F.	225–275	50–70	...

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taerythritol and sorbitol esters of tall oil may enlarge the market for refined tall oil in certain varnishes and paint bases.

The emulsifying properties of tall oil for insecticides, disinfectants, and certain printing inks may maintain a continued market in the future. The reappearance of petroleum sulphonates and the common sulphated (sulphonated) vegetable and animal fats may prevent the further development of tall oil and its sulphated or chlorinated derivatives in the fields of soluble oils, dye assistants, and leather-fat liquoring agents, in spite of a considerable history of use by several producing firms. Continued use of tall oil in core oils *(53)* and drawing compounds will depend almost entirely on cost comparisons with equivalents in vegetable oils and rosin.

War Emergency Markets

A number of soap manufacturers may be considered to be temporary consumers of tall oil during the war years, and may reasonably be expected to return to the more common fats, oils, and rosin, when supply stocks increase and competitive prices are reestablished.

Emergency use of refined tall oil for paint vehicles *(5)* and the more common types of varnish resins in the field of durable coatings (as contrasted with low-cost paints) may be expected to diminish with growing stocks of drying oils *(23)* and of natural and synthetic resins. The several serious difficulties met by paint manufacturers in attempting to adapt tall oil to traditional procedures must be presumed deterrents toward continued development in this industry.

Discussion

Present Products

Tall Oil as Produced. In summarizing the discussions of several writers *(22, 46, 60, 68, 107)*, West *(108)* has stated that "in the postwar economy, tall oil must compete with other materials which may be cheaper and more readily accessible in a purer form. Therefore, distinctive uses should be developed for tall oil in which it will do a better job at an equivalent or lower price per pound." West has also recently indicated that "the interest in tall oil during the war years is evidenced by the fact that, during the past 3 years, some 200 articles and patents (concerning tall oil) have appeared (in the technical and trade literature)."

Since the utilization of tall oil has received greatest impetus from its emergency substitution for fatty acids and rosin acids in the soap *(49)* and paint *(47, 73)* industries, no special references to these fields need be made here. The use of tall oil as an emulsifier in metal-working oils *(100)*, flotation agents, and asphalt compounds has also been well developed. The urgency of the war period has undoubtedly prevented the publication of a large body of experimental data on the utilization of refined tall oil. Unnecessary duplication of effort in laboratory and pilot-plant investigations may be prevented in large measure by an intensive study of industrial practices of the past 5 years in the fields just mentioned *(60)*.

TABLE V.—AVERAGE CHARACTERISTICS OF COMMON FATS AND OILS (9)

Lauric-Acid Group and Animal Fats (Soapmaking)

	Coconut	Palm Kernel	Babassu	Lard	Tallow
Iodine value	8–11	14–22	16	46–70	35–48
Saponification value	250–264	245–255	247	195–202	197
Unsaponifiable matter, % max.	0.5	0.8	0.5	1.0	0.8
Titer, °C.	20–25	24–26	23	36–42	40–46

Oleic-Linoleic Acid Group (Soapmaking)

	Cottonseed	Peanut	Olive	Palm
Iodine value	106–113	84–100	77–90	44–58
Saponification value	190–198	188–195	186–196	195–205
Unsaponifiable matter, % max.	1.5	1.0	2.3	0.8
Titer, °C.	32–36	26–32	16–26	40–47

Linolenic and Conjugated-Acid Groups (Paints and Varnishes)

	Linseed	Soybean	Tung	Oiticica	Dehydrated Castor
Iodine value	177	120–141	163	140–180	140–150
Saponification value	189–195	189–195	190–195	186–193	190
Unsaponifiable matter, % max.	1.5	1.5	0.75	1.0	.....
Acid No., max.	4	1	8	.....	2

Improved Tall Oil. Certain characteristics of the several brands of refined tall oil produced during the past few years must be considered as serious handicaps toward general acceptance by consumers in the future, particularly with growing stocks of war-restricted raw materials. Among these factors are poor stability toward heat and oxygen *(12, 44)*, dark and unstable color, unpleasant odor *(22)*, nonuniformity in composition of shipments, and corrosiveness toward containers and processing equipment. Although no entirely new markets may be expected to form solely through improvement of refined tall oil, many of those considered questionable might well be made permanent outlets for refined tall oil.

The paint and varnish industry has a place for refined tall oil of light color, uniformity of composition, and stability toward heat and oxidation. Improvement in these properties should better the position of tall oil in the industries producing soluble oils and textile processing aids. New entrances to the large soap-making market should be found merely through improvement of color and odor. Minimum corrosiveness *(67)* and maximum homogeneity in containers are properties of considerable value to distributors and consumers alike. Foreign research studies have been reported in the deodorization of tall oil *(3, 37)* and its purification with adsorbent materials *(74, 75, 76, 77)*. Controlled treatments with sulphuric acid *(27)* and with liquid sulphur dioxide *(15)* have been suggested to remove coloring matter and unsaponifiable constituents from tall oil, and heat treatment to improve both color and odor has been proposed *(71, 81)*.

Tall-Oil Fractionation.

The information gained from both the market survey and the literature emphasizes the potential value of separation of the major constituents of tall oil. The fatty acids, rosin acids, and unsaponifiable components are not only considered separately by the majority of consumers interviewed, but the high proportion of unwanted fractions in commercially refined tall oil has prevented its free utilization in a

TABLE VI.—PRINCIPAL FATTY ACIDS IN DOMESTIC TALL OILS
(Per Cent by Weight)

Reference	Oleic	Linoleic	Linolenic	Saturated
6	45	48	...	7
14	Present	Present in largest amount	4–6	4–6
43	Principally	Possibly small amount	Small amount	Small amount
68	19	75	6	...
82	16	78	6	...

variety of products. Many patents and research reports have been devoted primarily to the separation of fatty acids from rosin acids with varying degrees of completeness.

Several authors of articles on the production and marketing of tall oil have indicated the many potential consumers of fatty acids substantially free of rosin acids and unsaponifiable components, and of fatty acid-free rosin. McKee *(68)* has pointed out the possible use by the soap industry of both major fractions, and by the paint and varnish industry of fatty acids and rosin acids, each fraction containing less than 20% of the other. The industries producing textile oils, metallic driers (for varnishes), cutting oils, lubricating greases, soluble oils, and synthetic resins have been reported as probable consumers, in large quantities, of tall-oil fatty acids containing rosin acids in varying small proportions (below 30%). Hasselstrom *(45, 46)* has also emphasized the growing trend toward purified fractions of tall oil, according to the desire of the consumer.

Fractionation by Distillation. The fractionation of tall oil to yield the separate major constituents has been effected on an industrial scale primarily as a result of war-stimulated research and development. The methods of one large refiner have been adapted from the fractionation of common fats, including soybean and fish oils, to yield tall-oil acids containing only 15 and 5% rosin acids and 2 to 3% unsaponifiable constituents. A chemical company, after considering six refining processes, has developed at least one to give eleven derivatives of tall oil, including a fatty-acid fraction containing approximately 1% rosin acids.

Fractionation by Esterification. Wise *(110)* has discussed the methods of differential esterification applied to the separation of tall-oil fatty and rosin acids, and has emphasized the impracticality of many of them. Segessemann *(89, 92)* has patented several transesterification separations while Brown and Scott *(16)* have proposed a method for selective esterification of tall-oil acids. Loughlin *(62)* and Miller *(70)* have patented other processes for selective esterification. The methods of separation proposed by Gayer and Fawkes *(30, 31, 32, 33, 34)* have been developed primarily for acid-refined tall oil.

Fractionation by Solvent Extraction. The use of solvents in tall-oil purification has been the subject of a number of investigations reported principally in the patent literature. Gayer and Fawkes *(26, 32, 33)*, and Vilbrandt, Chapman, and Crockin *(106)* have combined esterification and extraction methods for the fractionation of tall oils. Adams *(2)*, Blengsli *(13)*, Hixson and Miller *(50, 51)*, Hixson and Hixson *(52)*, and Segessemann *(90)* have used hydrocarbon solvents while Jenkins *(58, 59)*, Ott *(78)*, Segessemann *(95)*, and Trimble *(101)* have made use of polar solvents in this field.

Tall-Oil Derivatives

Tall-Oil (Fatty Acid) Esters. The survey has indicated that a potential market exists for the esters of rosin-free fatty acids of tall oil, particularly in the paint industry, again within the limitations imposed by competitive fats and oils. Interest has been expressed in methyl esters, chiefly because of their low acid numbers, as extenders of linseed and soybean oils, and as components of alkyd resins; in aliphatic esters of higher molecular weights as plasticizers; and in glycerol and pentaerythritol esters of whole tall oil for varnishes. The development of the promising pentaerythritol esters has been reported in the literature *(17, 38, 109)*. Reppe and Wolff *(83)* have described a process for preparing vinyl esters of tall-oil acids.

Tall-Oil Rosin Acids. A potential market of considerable size is believed to exist in both the paint and soap industries for a purified and stabilized rosin fraction of tall oil. In view of the growing demand for rosin which is not expected to be satisfied by the estimated production of gum and wood rosin in the near future, an even broader field of utilization may be found for tall-oil rosin. Three types of purified stable rosin have been separated by different refining methods. The methods of tall-oil fractionation used by a fatty-acid refiner have yielded a rosin fraction of 60 to 70% purity, used by the producer in special soaps.

The potential market for a purified tall-oil rosin seems at least as large and as promising as that for tall-oil fatty acids and their simpler derivatives, as discussed above. It must be emphasized, however, that every known useful derivative of tall-oil, at whatever degree of purity, has as a direct competitor a material of accepted value, whether from vegetable or animal fats and oils, gum or wood rosin, natural resins, or from petroleum or coal sources.

Sulphated, Sulphurized, and Chlorinated Derivatives. The increasing demand *(9)* for sulphated derivatives of common fats and oils (particularly castor and fish oils and tallows) for use as surface-active agents in textile and leather finishing indicates a potential use for similar compounds derived from tall oil. The experimental conditions for tall-oil sulphation have been investigated by Vilbrandt, Chapman, and Crockin *(106)*. The properties of sulphated tall oil as an adhesive constituent for coated papers have been discussed by Getty *(36)* and by Stewart *(98, 99)*. A much smaller market for the sulphurized fatty-acid fraction of tall oil may be assumed in the fields of extreme pressure lubricants and metal-cutting oils, although recent experimental work has been reported *(1, 19)*.

Although little interest in chlorinated derivatives of tall oil has been reported in the literature, Grader

TABLE VII.—MAJOR CONSTITUENTS OF COMMON FATS AND OILS (9)
Composition in Per Cent by Weight

Lauric Acid Group and Animal Fats (Soapmaking)

Fatty Acid	Coconut	Palm Kernel	Babassu	Lard	Tallow
Lauric	46	47	44	..	..
Myristic	18	14	15	..	..
Palmitic	9	9	9	28	27
Stearic	..	..	..	12	14
Oleic	8	19	16	48	50

Oleic-Linoleic Acid Group (Soapmaking)

	Cottonseed	Peanut	Olive	Palm
Palmitic	23	8	7	32
Oleic	23	56	84	52
Linoleic	48	26	5	8

Linolenic and Conjugated Acid Groups (Paints and Varnishes)

	Linseed	Soybean	Tung	Oiticica	Dehydrated Castor
Oleic	25	28	4	6	9
Linoleic	19	54	..	..	60
Linolenic	47	6	..	..	..
Elaeostearic	..	..	91	..	..
Licanic	..	..	..	81	..
Conjugated linoleic	..	..	..	..	20

(39, 40) has mentioned chlorinated tall-oil as an emulsifier, and another patent *(54)* has suggested chlorinated tall oil for adhesive compounds. A formulator of metal-working compounds has mentioned the possible value of chlorinated tall oil in this application.

Hydrogenated Fatty Acids and Esters. The importance of hydrogenation processes in modern oil and fat technology used in the soap and edible-fat industries to convert oils and soft fats into more valuable hard fats and to stabilize fats and oils against deterioration has been well described *(9)*. Similar methods have been adapted to the hydrogenation of tall oil as an aid to the separation of its major constituents and to the saturation of tall-oil fatty acids and esters. The preparation of partially hydrogenated methyl and butyl esters of tall-oil fatty acids, of hydrogenated distilled tall oil, and of refined stearic acid has been reported by a chemical company. Dressler and Vivian *(20, 21)* have discussed methods of pretreatment and controlled hydrogenation of tall oil. The purification of tall oil before reduction has been described by Oliver and Palmer *(76)*. Papps and Othmer *(79)* have studied the separation of stearic and abietic acids by selective adsorption after hydrogenation. Segessemann *(91, 93)* has reported the saturation of saponified tall oil and the separation of fatty acids. The preparation of improved products from the unsaponifiable portions of tall oil by isolation, purification, and hydrogenation has been described by Turck *(102)*.

Isomerized Fatty Acids of Tall Oil. The recent development *(9)* of isomerized soybean and linseed oils as improved drying oils, with characteristics comparable to those of dehydrated castor oil and tung oil, is of particular interest in considering further refinement of the fatty-acid portions of tall oil. Although the economics of separation of linoleic acid from the other constituents of tall-oil fatty acids may well be prohibitive, the improvement in drying properties resulting from an increase in the content of conjugated linoleic acid through isomerization and from polymerization *(4, 94)* has been the subject of serious study. Isomerized oils have been reported to have certain disadvantages, including lower drying rates, softness of films, and development of "aftertack," as compared with commercial drying oils. The possible utilization of tall-oil fatty acids to yield polyamide resins *(18)* has been considered.

Tall-Oil Phytosterol. A potentially valuable fraction of the unsaponifiable portion of tall oil comprises the plant sterols, principally sitosterol, grouped under the name, phytosterol. The content of phytosterol in crude tall oil is considerably smaller than that of the sterols in halibut-liver oil and wheat-germ oil, but approximates that of cottonseed, corn, and soybean oils *(9)*. Interest in tall-oil phytosterol for the preparation of Vitamin D and certain hormones has been reported, while the market survey has indicated a potential market for phytosterol among certain refiners of fats and oils. Phytosterol has also been suggested for use as an emulsifying agent *(7)* and as an antioxidant. Increased knowledge concerning phytosterol, as well as other constituents of tall oil may be expected as a result of current work in molecular distillation. The extraction and concentration of tall-oil phytosterol has been investigated by both American and foreign workers *(27, 28, 29, 75, 87, 88, 96, 97)*, while uses for phytosterol have been discussed by Swedish investigators *(7)*. The separation of phytosterol from refined and fractionated tall oil has in its favor the resultant improvement in saponifying characteristics of the purified tall oil.

Summary

Estimates of current production have agreed roughly on a yearly volume of 206,000 tons of black liquor skimmings leading to a yield of 98,000 tons of crude tall oil of which the major portion is converted to approximately 40,000 tons of refined tall oil. A total recovery of sulphate-mill tall oils might yield 175,000 tons of crude tall oil annually, giving with maximum conversion, using present methods, a potential volume of refined tall oil equal to 130,000 tons per year.

Consumer opinion has indicated a general belief that tall oil has no unique properties beyond those of its major constituents, particularly in its applications to soap and paint manufacture. The fatty-acid fraction of tall oil may be considered a soap-making substitute for oils of the lauric-acid group and for animal and marine fats, and a paint-making replacement for oils of the linolenic and conjugated groups of fatty acids.

Tall oil has been accepted for several purposes as a source of rosin acids in place of scarce gum and wood rosin. Comparative statistics for production, distribution, specifications, analyses, and price trends of the major fats and oils, and of rosin have been summarized. Examination of related data has shown that acid numbers (and saponification numbers) of refined tall oils are somewhat lower than those for the common fats and oils; iodine numbers are considerably higher than those of the oleic-linoleic acid oils used in soap-making, but approach the values for linseed oil; and unsaponifiable components are present in far higher concentrations in tall oils than in fats and oils. Price comparisons of animal, marine, and vegetable fats have emphasized the competitive difficulties for future development of tall-oil sales.

The market survey has shown the application of tall oil to the fields of soaps and detergents; paints, varnishes, resins, and allied materials; refined fats and oils, and commercial derivatives; and emulsions, metal-working compounds, and miscellaneous materials. A market analysis has indicated an assured position for refined tall oil at present price levels in the manufacture of yellow laundry soaps, textile soaps, scouring compounds, and industrial detergents; as a constituent of lower-cost paints, particularly for interior use; and in the formulation of lower-priced enamels, water-miscible paints, and certain coverings and insulating compositions. A continued large demand for low-grade and crude tall oil in ore-flotation agents and asphalt-emulsifying compounds has been established.

Questionable markets for refined tall oil have been reported in the varnish-drier field, particularly in competition with metallic naphthenates. Other markets of doubtful position include the emulsification of insecticides, disinfectants, and certain printing inks, and the formulation of soluble oils, dye assistants, and leather-fat liquoring agents. Those markets which arose because of the shortage of raw materials and their restricted allocation through governmental control, and which may be expected to decrease or disappear in the near future, include the general field of soap-making and the production of paint vehicles and varnish resins for durable coatings.

The market survey has indicated certain characteristics of refined tall oil (common to all brands

marketed by sulphate mills and directly allied refiners) which are serious deterrents toward general acceptance by consumers. Among these have been mentioned poor stability toward heat and oxidation, dark and unstable color, unpleasant odor, nonuniformity in average composition of shipments, and corrosiveness toward containers and equipment. Improvement in these properties has been shown necessary for further development in tall oil utilization, particularly in the large paint- and soap-making industries.

The fractionation of tall oil to yield fatty acids, rosin acids, and unsaponifiable constituents of either actually or potentially greater value than the original material has been effected by several means, including distillation, esterification, and solvent extraction. Methods of isolation have been developed and, in some cases, reduced to practice for tall-oil derivatives, including tall-oil fatty-acid esters, rosin acids. sulphated and chlorinated compounds, separated and isomerized unsaturated fatty acids, hydrogenated fatty acids and their esters, and tall-oil phytosterol

Acknowledgment

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Paper and Paper Stock Imports At New York and Other Ports

NEW YORK IMPORTS

WEEK ENDING NOVEMBER 23, 1946

SUMMARY

Newsprint	3,702 rolls
Coated Paper	58 cs.
Wall Paper	4 cs., 1 pcl.
Paperhangings	40 pkgs.
Hanging Paper	36 pcls.
Tracing Cloth	48 cs.
Paper Napkins	6 cs.
Typewriting Paper	6 cs.
Serviettes & Wrapping Paper	20 cs.
Decalcomania Paper	115 cs., 13 drums
Photo Paper	104 cs.
Filter Paper	21 cs.
Drawing Paper	1 cs.
Wrapping Paper	16 cs.
Kraft Paper	60 rolls
Miscellaneous Paper	1-cs.

NEWSPRINT

H. G. Craig Co., A.C.D., Donnacona, 371 rolls.

(———), Buckeye State, Thorold, 2270 rolls.

H. G. Craig Co., G.T.D., Donnacona, 309 rolls.

H. G. Craig Co., Newscarrier, Dannacona, 381 rolls.

H. G. Craig Co., Donpaco, Donnacona, 371 rolls.

COATED PAPER

F. P. Gaskell Co., Eucadia, Glasgow, 58 cs. (cigarette tipping).

WALLPAPER

R. F. Downing & Co., Ile de France, Havre, 4 cs.

(———), Drottningholm, Gothenburg, 1 pcl.

PAPERHANGINGS

W. H. S. Lloyd & Co., John W. Brown, London, 40 pkgs.

HANGING PAPER

F. Henjes, Inc., Notre Dame Victory, Copenhagen, 36 pcls.

TRACING CLOTH

Keuffel & Esser Co., Sibley Park, Liverpool, 36 cs., (bleached cotton).

E. Dietzgen & Co., Sibley Park, Liverpool, 12 cs., (bleached cotton).

PAPER NAPKINS

Lewy Bros., Drottningholm, Gothenburg, 6 cs.

TYPEWRITING PAPER

Lafayette Co., Sibley Park, Liverpool, 6 cs.

SERVIETTES AND WRAPPING PAPER

H. P. Wassen & Co., Drottningholm, Gothenburg, 20 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., Sibley Park, Liverpool, 115 cs., 13 drums, (simplex and duplex).

PHOTO PAPER

Lep Transport Co., John W. Brown, London, 100 cs. (base).

J. J. Gavin Co., John W. Brown, London, 4 cs. (unsensitized).

FILTER PAPER

H. Reeve Angel & Co., Inc., John W. Brown, London, 21 cs.

DRAWING PAPER

H. Reeve Angel & Co., Inc., John W. Brown, London, 1 cs.

WRAPPING PAPER

Meadows Wye & Co., John W. Brown, London, 16 cs.

KRAFT PAPER

H. Reeve Angel & Co., Inc., Drottningholm, Gothenburg, 60 rolls.

MISCELLANEOUS PAPER

G. Perralada, Drottningholm, Gothenburg, 1 cs.

RAGS, BAGGINGS, ETC.

New England Waste Co., Louis McHenry Howe, Bombay, 500 bls. cotton waste.

W. Steck, Louis McHenry Howe, Alexandria, 91 bls. old hessian bagging.

1st National Bank of Boston, Louis McHenry Howe, Alexandria, 110 bls. cotton waste.

D. Benedetto, Inc., Bight Knot, Havana, 56 bls. rags.

(———), Sibley Park, Liverpool, 17 bls. woolen rags; 7 bls. wool thread waste.

Riverside Mills, Albion Victory, Alexandria, Alexandria, 21 bls. cotton waste.

English, Scottish & Australia Bank Ltd., Sea Nymph, Melbourne, 26 bls. hosiery cuttings; 10 bls. waste cuttings.

Swiss Bank Corp., Sea Nymph, Melbourne, 173 bls. wool rags.

(———), Sea Nymph, Melbourne, 11 bls. wool rags.

J. Eizenberg, Inc., Rio Parana, Buenos Aires, 24 bls. rags; 69 bls. wool waste.

Padawer Corp., Rio Parana, Buenos Aires, 95 bls. cotton waste.

John A. Manning Paper Co., John W. Brown, London, 54 bls. paperstock.

Tradesmans National Bank Trust Co., John W. Brown, London, 186 bls. paperstock.

Darmstadt Scott & Courtney, Middlebury Victory, Genoa, 379 bls. old bagging.

(———), Boston City, Bristol, 715 bls. old webbing.

Continental Bank Trust Co., Boston City, Bristol, 23 bls. webbing.

Irving Trust Co., Walter M. Christiansen, Rio de Janiero, 145 bls. cotton waste.

OLD ROPE

(———), Boston City, Bristol, 45 coils.

CHINA CLAY

English China Clays Sales Corp., Boston City, Bristol, 50 casks.

CASEIN

Eugenio Lang, Inc., Rio Parana, Buenos Aires, 834 bags, 50040 kilos.

GLUESTOCK, ETC.

Transatlantic Animal By Products Corp., Middlebury Victory, Genoa, 150 bls. gluestock.

Bankers Trust Co., Walter M. Christiansen, Rio de Janiero, 200 bags boneglue.

BOSTON IMPORTS

WEEK ENDING NOVEMBER 23, 1946

Pulp Sales Corp., Notre Dame Victory, Jakobstad, 5035 bls. prime extra strong unbleached sulphite pulp, 1007 tons.

Pulp Sales Corp., Notre Dame Victory, Kemi, 775 bls. prime unbleached sulphite pulp, 155 tons; 7290 bls. prime unbleached sulphate pulp, 1458 tons.

(———), Notre Dame Victory, Topilla, 10507 bls. prime unbleached kraft sulphate pulp, 2068 tons.

PHILADELPHIA IMPORTS

WEEK ENDING NOVEMBER 23, 1946

Pulp Sales Corp., Notre Dame Victory, Jakobstad, 1458 bls. prime extra strong unbleached sulphite pulp, 287 tons.

Pulp Sales Corp., Notre Dame Victory, Kemi, 800 bls. prime unbleached light and strong unbleached sulphate pulp, 157 tons; 4590 bls. prime unbleached kraft sulphate pulp, 902 tons.

(———), Notre Dame Victory, Topilla, 520 bls. prime unbleached kraft sulphate pulp 102 tons.

Pulp Imports Pass Half Million Mark

WASHINGTON, D. C. — Imports of wood pulp into the United States from overseas totaled 16,951 short tons during the week ended November 14, 1946, the Forest Products Section, Office of Domestic Commerce, Department of Commerce, reported last week. The aggregate quantity of wood pulp imported from overseas sources from January 4 through November 14 amounts to 509,985 short tons. Of this total, 420,049 tons were imported from Sweden as against 89,936 tons from Finland. In the week ended November 14, 6,528 tons of wood pulp were imported from Sweden while 10,423 tons came from Finland.

Week's Record of Trends in The Pulp and Paper Market

Office of the PAPER TRADE JOURNAL,
Wednesday, November 27, 1946.

Demand for paper, paperboard, wood pulp, and a growing list of converted paper products is pushing the industry to increase its current record receipts of pulpwood. Expansion and improvement programs of existing pulp, paper and board making facilities expected to add 3 million tons to capacity during 1947 and 1948 depend largely on available supplies of economically marketable pulpwood. That the pulpwood industry can and will meet the challenge is indicated by the fact that receipts of domestic and imported pulpwood are expected to reach an all time high of 18,500,000 cords for 1946. Thus, with the present shortage of paper and paperboard estimated around 4 million tons on an annual basis, which is probably overestimated by ½ to 1 million tons, and an increase in capacity of 3 million tons anticipated, it looks as if the industry has paved the way to a practical balance in supply and demand by 1948.

With per capita consumption of paper constantly on the increase there is every indication that all additional output will find a ready market, provided general business activity remains high. Some quarters caution that industrial output must be brought in line with prices and wages, both of which are far out of line. If this is not done, a most acute demand will follow, which will lead to unbridled speculation in raw materials and the withholding of goods from the market. A resulting decline in business generally would tend to weaken prices and intensify competition in the pulp, paper and board market. Further, with rising labor costs and greatly extended productive capacity, pulp and paper mills will be more vulnerable when supply and demand once again come into normal balance and real competition returns to the pulp and paper market.

Meanwhile, current supplies of paper, pulp and board are readily absorbed, and technological developments are constantly increasing the market for cellulose products. One ominous cloud on the horizon is the threat of another prolonged stoppage of coal production. Otherwise, except for the problem of adequate market wood pulp, handicaps to production in the pulp and paper industry are not serious. With mills continuing to allocate production among their established customers, except in rare cases, there is less and less duplication of orders. Deliveries are reported by some mills 30 to 60 days behind and may be delayed further from mills which recently accepted "priority" Government orders for paper. Distributors continue to report kraft papers, toilet tissue and book papers as being in shortest supply.

The index of general business activity for the week ended November 16 rose to 143.1 from 142.2 in the previous week, compared with 123.7 for the corresponding week in 1945. The index of paperboard production fell to 167.4 from 172.6 in the previous week, compared with 151.4 for the corresponding week in 1945.

Paper production for the week ended November 16 was estimated at 104.9 per cent, compared with 106.8 for the preceding week, with 96.4 for the corresponding week in 1945, with 90.3 for 1944, with 91.4 for 1943, and with 86.9 percent for the corresponding week in 1942.

Paperboard production for the week ended November 16 was 101.0 percent of capacity, compared with 102.0 for the preceding week, with 95.0 for the corresponding week in 1945, with 96.0 for 1944, with 94.0 for 1943, and with 83.0 percent for the corresponding week in 1942.

Wood Pulp

Despite the high level of domestic wood pulp production, which is expected to total 10,500,000 tons for 1946, mills which do not manufacture their own pulp are experiencing difficulties in finding adequate offerings of purchase pulp not only to support capacity production but also to replenish inventories against the uncertainties of obtaining supplies during the coming months.

Confronted with the increasing possibility that only a limited quantity of Swedish pulp may be forthcoming during the remainder of the current shipping season, the only means left to offset some of the deficit lies in stepping up production of market pulp by North American manufacturers, particularly in the Pacific Northwest. Whether the new selling prices will offer these manufacturers sufficient inducement to increase their output only time can tell.

Old Rope and Bagging

Market for old rope remains steady and firm with foreign Manila showing some improvement at 6 to 7 cents per pound. Domestic Manila continues at 5.75c, jute string 4.50 to 5c, and sisal strings 4.00 to 4.50c.

Bagging continues active with paper mills paying $4.50 f.o.b. New York for No. 1 domestic gunny and $5.00 per 100 pounds for foreign gunny. Heavy wool tares are reported at $5, light wool tares at $4.50 to $4.75; and bright bagging at $4.50.

Rags

Receipts of new cotton cuttings by fine paper mills have been dropping steadily since the beginning of the year. As a result, new cotton has been substituted, with these mills currently using cotton and rags on a 50-50 basis.

New domestic white shirt cotton cuttings are currently reported at $10.50 per 100 pounds delivered mills plus dealer's commission. Unbleached muslin at $11.00; white back blue overalls at $8.25; and new foreign white cotton cuttings at $13.00 to $15.00 are all in particularly good demand.

Waste Paper

Market for waste paper remains firm with demand strong for most all grades. High prices have not interferred with this very active market. No. 1 hard white envelope cuts are currently running $100.00 to $110.00 per ton for one cuts to paper mills f.o.b. New York. Unruled No. 1 hard white shavings are $100; No. 1 soft white shavings $75 to $80 and $85 to $90 for one cuts; Kraft envelope cuttings $80 to $85 and new 100% Kraft corrugated cuttings $55 to $60; white blank news $45; and overissue news $35.00.

"Bargaining List" Still Open As Supplements May Be Added

NEW YORK—Explaining comment on the fact that wrapping papers were not included on the list of commodities recently published by the State Department as the "bargaining list" for the forthcoming renegotiation of Reciprocal Trade Agreements, the American Paper and Pulp Association points out that this may be due to the fact that Finland and Sweden, principal exporters of these papers to the United States, are not included among the eighteen nations presently invited to the conferences. Sweden is a neutral, and, technically, Finland is still outside the fold of Allied Powers. However, attention should be called to the fact that the State Department's announcement of the present "bargaining list" states that supplementary lists may be issued later.

Senator Brewster of Maine, in a talk before the Woolen Jobbers' Association at New York, November 19, outlined broadly the attitude of the new Republican Congressional leadership toward the trade agreement program. He stated that the new Congress will undoubtedly take some action on the general matter of trade agreements, possibly to see that responsibility for the study and analysis of the effects of the agreements will not continue to rest, as at present, entirely with the State Department, which is subject to diplomatic pressure. He also said that any agreements should be subject to "escape clauses" providing that either country might modify the agreement if real injury to domestic industry resulted. He recognized that heretofore such escape clauses have amounted to little more than a meaningless gesture.

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, November 27, 1946.

BLANC FIXE—Demand reported active with raw materials still tight. Pulp is currently quoted at $40 per ton, in barrels, car lots, at works; the powder is currently quoted at $60 per ton, car lots, f.o.b. works.

BLEACHING POWDER — Supplies reported adequate to meet demands although drum shortage delays current shipments. Quotations are unchanged. Prices on bleaching powder range from $2.50 to $3.10 per 100 pounds, in drums, car lots at works.

CASEIN—Current prices on processed acid precipitated casein are reported around 46 to 49 cents per pound for both domestic and Argentine grades; f.o.b. shipping point, with quantity not specified at the present time.

CAUSTIC SODA—Supplies tightest ever as market remains critical. Shipments are behind schedule. Cutback production further reduces stocks. Solid caustic soda is quoted at $2.30 per 100 pounds; flaked and ground is quoted at $2.70 to $2.95 per 100 pounds. All prices car lots.

CHINA CLAY—Supplies are becoming tighter as demand continues to increase. Quotations remain unchanged. Domestic filler clay is currently quoted at from $8.50 to $9 per ton; coating clay is quoted at from $12 to $22 per ton, at mine. Imported clay is quoted at from $22 to $25 per long ton, ship side. All prices quoted in car lots.

CHLORINE — Demand continues to exceed output, market tight, stocks low. Tank cars and steel container situation slow shipments. Quotations unchanged. Chlorine is currently quoted at $2.00 to $2.25 per 100 pounds, in single unit tank cars, f.o.b. works.

ROSIN—Gum rosin in drums, per 100 pounds net, in yard, New York, B & D, $8.30; E, $8.50; F, G, H, I, M, N, WG & WW, $8.60. All prices in car lots for drums and bags.

SALT CAKE — Demand increasing with supplies showing some improvement. Prices remain unchanged. Domestic salt cake is quoted at $15 per ton in bulk. Chrome salt cake is quoted at $16 per ton. All prices in car lots f.o.b. shipping point.

SODA ASH—Supplies continue short, demand active, previous orders filled. Export inquiry very heavy. Quotations continue unchanged. Current prices, car lots, per 100 pounds, are as follows: in bulk, $.95; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Supplies are showing steady improvement. Previous orders filled. Starch prices continue unchanged. The pearl grade is quoted at $4.77 per 100 pounds; powdered starch at $4.87 per 100 pounds; both prices in bags, car lots f.o.b. Chicago.

SULPHATE OF ALUMINA—Demand active, supply fair. Quotations continue unchanged. The commercial grades are quoted at from $1.15 to $1.20 per 100 pounds, in bags, car lots, f.o.b. works. The iron free is currently quoted at $1.75 to $2.00 per 100 pounds, in bags, at works.

SULPHUR—Strong seasonal demand is reported with stocks plentiful to meet all requirements. Annual contracts are quoted at $16 per long ton, f.o.b. mines; the price f.o.b. at Gulf Ports is $17.50 per long ton. All prices in car lots.

TALC—Domestic and French grades are moving in fair volume with prices steady. Domestic grades are currently quoted at from $16 to $30 per ton at mines; Canadian at $24 to $30 per ton. All prices on car lots.

MARKET QUOTATIONS

With the sudden, but not unforeseen, elimination of all OPA price controls on paper, pulp, rags and other materials, the quotations given below once more become indicative of trends in an open market. At the moment they can be of little more, for, while some volume of business still is being done, under contract at the figures given below, fluctuations representing special conditions are too varied and too frequent to permit prices to be given as representing a wholly stabilized market. As the emergency conditions pass, it may be expected that the quotations will become more generally applicable.

Paper

(Delivered New York)

Standard News, per ton—
Roll, contract ....$84.00 @ —
Sheets ..... 93.00 @ —

Kraft—per cwt.—Carload Quantities
Zone A, Delivered
Superstandard
Wrapping .....*$5.25 @ —
No. 1 Wrapping.. *5.00 " —
Standard Wrapping*4.75 " —
Standard bag.....*4.75 " —

* Prices for Standard Wrapping are for 40 lb. base weight; for Standard Bag for 30 lb. base weight.

Tissues—Per Ream 24x36 (480) 10 lb. Zone 1.
Wh. No. 1 Frd. ... 1.10 @ 1.20
Wh. No. 1 M. G. .. 1.10 @ 1.20
Wh. No. 1½ ..... .95 @ 1.10
Wh. No. 2 ..... 1.00 @ 1.10
Wh. Anti-Tar. .... 2.25 @ 3.50
Kraft Unbl. ..... 1.15 @ 1.25
Manila No. 2 ..... .90 @ 1.05

Toilet—Per Case of 100 rolls 1 M Sheets.
Unbleached ..... 4.47 @ 5.50
Bleached ..... 6.50 " —

Paper Towels — Per Case of 3750 Zone 1.
Wh. C. fold 11x13⅓ 4.09 @ —
Br. Sgl. fold 10 in. 2.37 " 2.48
Br. M'tif'd 9⅓x14¾ 3.48 " —
Br. M'tif'd 9⅓x9¼ 2.37 " 2.48

Manila—per cwt.—C. l. f. a.
No. 1 Jute .....11.25 @ —
No. 1 Manila 35 lb. 6.00 " 7.00

Boards, per ton—
News .....*59.00 @ —
Chip .....*58.00 @ —
Sgl. Mla. Lt. Chip*67.00 @ —
White Pat. Coated*86.00 @ —
Kraft Liners 50 lb.*74.00 " —
Binders Boards... 84.00 " 116.00

Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices, all deliveries in Zone 1:

Rag Content Bonds and Ledgers—White, Assorted Items

	Bonds	Ledgers
100% Rag Ext.		
No. 1	$39.75@$46.75	$40.90@$48.00
100% Rag.	32.85 " 38.50	34.00 " 40.00
85% Rag	.... "	30.55 " 38.75
75% Rag	24.30 " 28.50	24.45 " 30.00
65% Rag	.... "	.... " ....
50% Rag	20.05 " 24.50	21.25 " 25.75
25% Rag	17.85 " 21.75	19.00 " 23.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers..
White, Assorted Items

	Bonds	Ledgers
No. 1	$12.00@$14.50	$13.15@$16.00
No. 2	11.25 " 13.75	12.25 " 15.00
No. 3	.... "	.... " ....
No. 4	10.60 " 13.00	11.75 " 14.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—
White, Cased Paper
No. 1 Glossy Coated.. $14.70@$16.75
No. 2 Glossy Coated.. 13.75 " 15.50
No. 3 Glossy Coated.. 13.20 " 16.00
No. 4 Glossy Coated.. 12.80 " 14.50
No. 1 Antique (Watermarked) ..... 11.35 " 12.90
No. 2 Offset ..... 10.65 " 12.25
A Grade E. F. ..... 10.60 " 12.00
A Grade S. & S. C. .. 11.00 " 12.50
B Grade E. F. ..... 10.30 " 11.75
B Grade S. C. ..... 10.70 " 12.25
C Grade E. F. ..... 10.00 " 11.50
C Grade S. C. ..... 10.40 " 12.00
D Grade E. F. ..... 9.70 " 11.00
D Grade S. & S. C. .. 10.10 " 11.50

Ivory & India at $.50 cwt. extra.

Wood Pulp

Domestic Prices and Canadian Manufacturers' Prices, Less Freight Allowances.

Bl. Softwood Sulphite.....	$103.50
Unbl. Softwood Sulphite....	90.00
Bl. Hardwood Sulphite.....	100.50
Unbl. Hardwood Sulphite....	87.50
N. Bleached Sulphate.....	103.50
S. Bleached Sulphate.....	97.00
N. Semi-Bleached Sulphate..	98.00
S. Semi-Bleached Sulphate..	91.50
N. Unbl. Sulphate.....	83.50
S. Unbl. Sulphate.....	76.50
Bleached Soda.....	93.50
Unbleached Soda.....	88.00
Groundwood	64.00
Ground—Machine Dried....	67.00
Sulphite Screenings.....	50.00
Sulphate Screenings.....	44.00
Groundwood Screenings.....	37.50
N. Unbl. Sulphate Siderums	83.50
S. Unbl. Sulphate Siderums	76.50
Standard Newsprint Siderums	64.00

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$12.50
Lake Central	12.50
Southern	15.00
West Coast (in area)	9.50
West Coast (out area).....	15.50

	50%-80% Air Dry Weight
Northeast	$10.50
Lake Central	10.50
Southern	13.00
West Coast (in area)	8.50
West Coast (out area)	14.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$7.50
Lake Central	7.50
Southern	10.00
West Coast (in area)	6.50
West Coast (out area)	12.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices.

New Domestic Cotton Cuttings

(Prices delivered Mill Plus Dealer's Commission)

	Per 100 lbs.
White Shirt	$10.50
Light Silesias	7.50
Unbleached Muslin	11.00
White Back Blue Overalls ..	8.25
Blue Overalls	7.75
Unbl. Fancy Shirt	4.50
Light Percales	5.50
Light Prints	5.25
Washables	4.00
Blaechable Khaki	5.50
Unbleachable Khaki	5.00
Cottonades	4.50

Old Domestic Cotton Rags

(F.O.B. Shipping Point Plus Dealer's Commission)

	Per 100 lbs.
No. 1 Whites Repacked	$5.00
No. 1 Whites Miscellaneous	4.25
No. 2 Whites Repacked	4.00
No. 2 Whites Miscellaneous	3.50
Blue Overalls	3.75
Thirds and Blues Repacked	3.00
Thirds and Blues Miscellaneous	2.50
No. 1 Roofing Rags	1.85
No. 2 Roofing Rags	1.75
No. 3 Jute Bagging	1.65
No. 4 Brussels and hard back carpets	1.65
No. 5A Roofing Rags	1.65

New Foreign Cotton Cuttings

(Prices delivered Mill)

	Per 100 lbs.
New Dark Cuttings	$6.00 to ....
New Mixed Cuttings	6.50 " ....
Light Silesias	9.00 " 10.00
Light Flannelettes	8.00 " 9.00
New White Cuttings	13.00 " 15.00
Fancy Shirt Cuttings	9.00 " 10.00
Light Prints	8.00 " 10.00
Bleachable Khaki, No. 1	7.00 " 7.50
Unbl. Khaki, No. 1	6.25 " 6.75

Old Foreign Rags

(F.O.B. New York)

	Per 100 lbs.
No. 1 White Linens	$14.00 to 16.00
No. 2 White Linens	12.00 " 13.00
No. 3 White Linens	8.00 " 9.00
No. 4 White Linens	8.00 " 9.00
No. 1 White Cottons	10.00 " 12.00
No. 2 White Cottons	8.00 " 9.00
No. 3 White Cottons	6.50 " 7.00
No. 4 White Cottons	5.00 " 5.50
Extra Light Prints	7.50 " 8.00
No. 1 New Light Prints	6.25 " 6.75
Med. Light Prints	5.25 " 5.75
Dutch Blue Cottons	5.25 " 5.50
Checks and Blues	4.00 " 4.25
Linsey Garments	4.50 " 5.00
Dark Cottons	3.75 " 4.00
Old Shopperies	3.25 " 3.50
New Shopperies	3.25 " 3.50

BAGGING

(Prices to Mill, f.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny, No. 1	$4.75 to 5.00
Domestic Gunny, No. 1	4.25 " 4.50
Light Wool Tares	4.50 " 4.75
Heavy Wool Tares	4.75 " 5.00
Bright Bagging	4.25 " 4.50
Foreign Manila Rope	6.00 " 7.00
Domestic Manila Rope	5.75 " ...
Jute Strings	4.50 " 5.00
No. 1 Sisal Strings	4.00 " 4.50
Mixed Strings	1.75 " ...

Waste Paper

Prices to Mills

(Dollars Per Ton)

F.o.b. New York, Baled

No. 1 Hard White Envelope Cuts, one cut	$100.00 @ $110.00
No. 1 Hard White Envelope Cuts	85.00 " 100.00
No. 1 Hard White Shavings, unruled	100.00 " —
No. 1 Hard White Shavings, ruled	80.00 " 90.00
Soft White Shavings, one cut	85.00 " 90.00
No. 1 Soft White Shavings	75.00 " 80.00
Soft White Shavings, Misc.	65.00 " —
No. 1 Fly Leaf Shavings	40.00 " —
No. 2 Fly Leaf Shavings	(nominal)
No. 1 Groundwood Fly Leaf Shavings	30.00 " 33.00
No. 2 Mixed Groundwood Fly Leaf Shavings	(nominal)
Mixed Colored Shavings	(nominal)
Mixed Groundwood Colored Shavings	(nominal)
Overissue Magazines	(nominal)
No. 1 Heavy Books & Magazines	38.50 " —
Mixed Books	22.00 " 25.00
No. 1 White Ledger	50.00 " 52.00
No. 2 Mixed Ledger, colored	40.00 " 45.00
New Manila Envelope Cuttings, one cut	65.00 " 75.00
New Manila Envelope Cuttings	65.00 " 75.00
Extra Manilas	(nominal)
Mixed Kraft, Env. & Bag Cuttings	70.00 " —
Kraft Envelope Cuttings	80.00 " 85.00
Triple Sorted, No. 1 Brown Soft Kraft	55.00 " —
New 100% Kraft Corrugated Cuttings	55.00 " 60.00
No. 1 Assorted Old Kraft	40.00 " —
New Jute Corrugated Cuttings	27.00 " —
Old 100% Kraft Corrugated Containers	(nominal)
Box Board Cuttings	23.00 " —
White Blank News	45.00 " —
Overissue News	35.00 " —
No. 1 News	25.00 " 26.00
No. 1 Mixed Paper	19.00 " 21.00
Old Corrugated	28.00 " 30.00
Mill Wrappers	22.00 " 25.00

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—	
India	.26 @ —
White Hemp	.26 " —
Fine Polished—	
Fine India	.31 " —
Unpolished—	
Box	.20¾ " —
Paper Makers	.20 " —
Tube Rope	.22 " —
Wall Paper	.23½ " —
Wrapping	.26 " —
Soft Fiber Rope	.22 " —
Cotton	.28 " —
(Hard Fiber)	
Medium Java	.23 " —
Mex. Sisal	.21 " —
Manila	.33 " —

PHILADELPHIA

Domestic Rags (New)

(Price to Mill)

Shirt Cuttings—	
New White No. 1	.07¾
New White No. 2	.05¾
Light Silesias	.05¾
Black Silesias, soft	.03¾
New Unbleached	.07½
Washable Prints	.04¾
Washable No. 1	.03
Blue Overall	.05½
Cottons—According to grades—	
Washable Shredding	.01¾
Fancy Percales	.04¾
New Black Soft	.03¾
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04¼
Men's Corduroy	.03½
Ladies' Corduroy	.03
Cottonades	.03¾

Domestic Rags (Old)

White No. 1—Repacked	3.80 @ —
Miscellaneous No. 1	3.20 " —
Miscellaneous No. 2	2.65 " —
White No. 2—Repacked	2.90 " —
Thirds and Blues—	
Miscellaneous	1.80 " —
Repacked	2.20 " —
Black Stockings—	
(Export)	Nominal
Roofing Stock—	
Foreign No. 1	Nominal
Domestic No. 1	1.55 " —
Domestic No. 2	1.45 " —
Roofing Bagging	1.35 " —
Old Manila Rope	5.75 " —

Bagging

(F. o. b. Phila.)

Gunny No. 1—	
Foreign	Nominal
Domestic	3.00 @ 3.50
No. 1 Clean Bright—	
Sisal Strings	.04 " —
No. 2 Clean Bright—	
Sisal Strings	.03 " —
Sisal Jute	.02½ " .02¾
Scrap—	
No. 1	3.25 " 3.50
No. 2	1.75 " 1.80
Wool Tares, heavy	4.00 " 4.25
No. 1 New Light Burlap	3.00 " 4.00
New Burlap Cuttings	3.75 " 4.00

Old Papers

(F. o. b. Phila.)

Mill Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½ @ —
No. 1 Hard White Shavings, unruled	2.87½ " —
Soft White Shavings, one cut	2.50 " —
White Blank News	1.65 " —
Soft White Shavings, Misc.	2.15 " —
No. 1 White Ledger	2.30 " —
No. 2 Ledger, colored	2.00 " —
No. 1 Heavy Books & Magazines	1.92½ " —
Overissue Magazines	1.67½ " —
New Manila Envelope Cuttings	2.65 " —
No. 1 Assorted Old Kraft	1.75 " —
No. 1 Mixed Paper	.95 " —
Box Board Cuttings	.72½ " —
Kraft Corrugated Cuttings	2.25 " —
Old Corrugated Containers	1.40 " —
Overissue News	1.00 " —
No. 1 News	1.00 " —

BOSTON

Old Papers

(F. o. b. Boston)

Mill Prices, Baled

No. 1 Hard White Shavings, unruled	4.00 @ —
No. 1 Hard White Shavings, ruled	4.00 " —
Soft White Shavings, Mis.	2.15 " —
No. 1 Fly Leaf Shavings	2.00 " —
No. 2 Fly Leaf Shavings	1.65 " —
No. 1 Groundwood Fly Leaf Shavings	1.25 " —
No. 2 Groundwood Fly Leaf Shavings	.90 " —
Mixed Colored Shavings	.75 " —
New Manila Envelope Cuts, one cut	2.87½ " —
Hard White Envelope Cuts, one cut	3.37½ " —
Triple Sorted No. 1 Brown Soft Kraft	3.00 " —
Mixed Kraft Env. & Bag Cuttings	2.75 " —
Kraft Envelope Cuttings	3.25 " —
No. 1 Heavy Books & Magazines	1.91½ " —
New Manila Envelope Cuts, one cut	2.87½ " —
New Manila Envelope Cuttings	2.65 " —
White and Colored Tabulating Cards	2.25 " —
Groundwood Tabulating Cards	1.35 " —
White Blank News	1.65 " —
No. 1 Assorted Old Kraft	1.75 " —
No. 1 Mixed Paper	.95 " —
Overissue News	1.25 " —
Box Board Cuttings	.72½ " —
New Corrugated Cuttings, Kraft	2.25 " —
Old 100% Kraft Corrugated Containers	1.75 " —
Old Corrugated Containers	1.40 " —
Jute Corrugated Cuttings	1.07½ " —

Bagging

(F. o. b. Boston)

Gunny Bagging—	
Foreign	4.50 @ —
Domestic	4.25 " —
Sisal Rope No. 1	5.00 " —
Sisal Rope No. 2	4.50 " —
Mixed Rope	2.00 " —
Transmission Rope—	
Foreign	(nominal)
Domestic	3.50 " —
Manila Rope—	
Foreign	(nominal)
Domestic	5.75 " —
Soft Jute Rope	5.00 " 5.25
Jute Carpet Threads	3.00 " 3.50
Bleachery Burlap	8.50 " 9.00
Scrap Burlap—	
Foreign	(nominal)
Domestic	4.50 " 4.75
South America	4.50 " 5.00
Wool Tares—	
Foreign	4.85 " 5.25
Domestic	4.85 " 5.25
Aust. Wool Pouches	5.00 " 5.35
New Zealand Wool Pouches	— " 3.50
New Burlap Cuttings	5.50 " 6.00
Heavy Baling Bagging	4.50 " 5.00
Paper Mill Bagging	2.50 " 3.00
No. 1 Roofing Bagging	1.60 " 1.75

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—	
New Light Prints	.06 @ .06½
Fancy Percales	.04¼ " .05
New White No. 1	.06¾ " .07
New Light Flannelettes	.09½ " .10
Canton Flannels, Bleached	.06 " .06¾
Underwear Cutters, Bleached	.06¼ " .06¾
Underwear Cutters, Unbleached	.05¾ " .06
Silesias No. 1	.06 " .06¾
New Black Silesias	.03 " .03¾
Red Cotton Cuttings	.03½ " .04
Soft Unbleached	.11½ " .12
Blue Cheviots	.05½ " .04
Fancy	.02¾ " —
Washable	.02¾ " —
Khaki Cuttings	.02¾ " .03
O. D. Khaki	.06 " .06¼
Corduroy	.03¼ " .03½
New Canvas	.06¼ " .06½
B. V. D. Cuttings	.11½ " .12

Domestic Rage (Old)

(F. o. b. Boston)

White No. 1—	
Repacked	3.80 @ —
Miscellaneous	3.20 " —
White No. 2—	
Miscellaneous	2.65 " —
Twos and Blues, Repacked	2.20 " —
Old Blue Overalls	2.25 " 2.50
Thirds and Blues, Repacked	2.20 " —
Miscellaneous	1.80 " —
Black Stockings	3.50 " 4.00
Roofing Stock—	
No. 1	2.00 " —
No. 2	1.90 " 2.00
No. 3	1.35 " —
No. 4	1.35 " —
No. 5, Quality A.	1.35 " —
Quality B.	1.20 " —
Quality C.	.95 " —
Old Manila Rope	5.75 " —

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

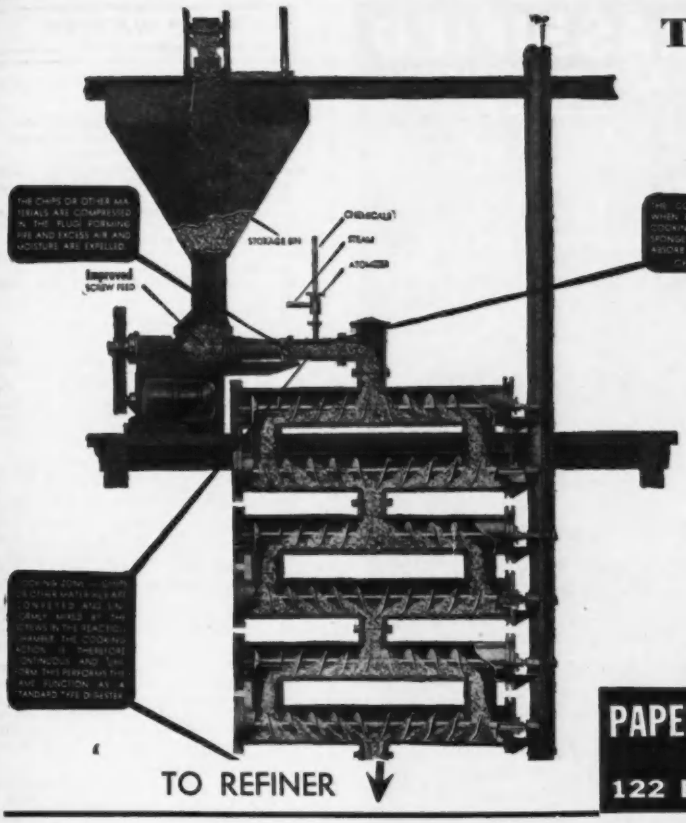
CHICAGO

Waste Paper

(F. o. b. Chicago)

Mill Prices, Baled

Shavings—	
No. 1 Hard White Envelope Cuts, one cut	3.37½ @ —
No. 1 Hard White Shavings, unruled	2.87½ " —
No. 1 Soft White Shavings	2.50 " —
No. 1 White Ledger	2.30 " —
No. 1 Heavy Books & Magazines	1.92½ " —
White Blank News	1.65 " —
Mixed Kraft Env. & Bag Cuttings	2.75 " —
No. 1 Assorted Old Kraft	1.75 " —
Overissue News	1.10 " —
No. 1 News	1.00 " —
No. 1 Mixed Paper	.95 " —
No. 1 Roofing Rags	1.55 " —
No. 1 Roofing Bags	1.45 " —



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for every paper industry requirement!

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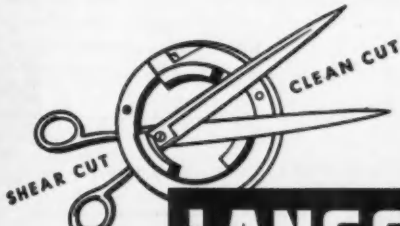
61 POPLAR STREET • BROOKLYN 2, N. Y.



LANGSTON
Slitters and Roll Winders

For a true, clean cut and rolls of uniform density... specify *Langston.*

SAMUEL M. LANGSTON COMPANY, *Camden, New Jersey*

The Trade-Mark of
LONG LIFE FELTS

The Waterbury Felt Co.

SKANEATELES FALLS, N. Y.

HELP WANTED

Design Engineer

Excellent opportunity in one of the world's largest integrated pulp, paper and bag plants for man experienced in designing light automatic equipment, preferably bag machines. Working knowledge of general maintenance and machine shop methods also desirable. Prefer man 30 to 45 years of age. Unlimited opportunities for right man. Salary negotiated. Give full particulars in letter to Employment Manager, Box 570, Savannah, Ga. N-28

SUPERINTENDENT

We need a competent man at our Middletown, Ohio paper mill who can take over full responsibility in operating our 6-cylinder 82-inch Liner mill. This is an unusual opportunity for an experienced man who is looking for a permanent position at a very good salary. PRAIRIE STATE PAPER MILLS, 110 South Dearborn Street, Chicago 3, Illinois. TF

SALARIED POSITIONS

$2,500-$25,000. This thoroughly organized confidential service of 36 years' recognized standing and reputation carries on preliminary negotiations for supervisory, technical and executive positions of the calibre indicated. Retaining fee protected by refund provision. Identity covered and present position protected. Send only name and address for details.

R. W. BIXBY, INC.
117 Dun Bldg, Buffalo 2, N. Y.

WANTED—TOUR FOREMAN

IMMEDIATE OPENING FOR A TOUR FOREMAN WORKING ROTATING SHIFTS.
ONE M. F. PICKUP AND ONE YANKEE PICKUP FOURDRINIER TISSUE MACHINES ARE OPERATING AT PRESENT. A THIRD HIGH SPEED TISSUE MACHINE WILL BE IN OPERATION IN LATE 1947.
WE PREFER A MAN 30-40 YEARS OF AGE WITH SOME TECHNICAL BACKGROUND. EXPERIENCE ON HIGH SPEED TISSUE MACHINES MAKING BOTH FLAT AND CREPED PAPERS DESIRABLE.
SEND COMPLETE RESUME GIVING EDUCATION AND EXPERIENCE TO
FERNSTROM PAPER MILLS, INC.
Pomona, California D-26

GUMMING SUPERVISOR—Wanted by large well established paper converter. Should have practical experience in production of gummed paper and cloth tapes and gummed specialty papers. Give full details of qualifications and experience. Address Box 46-612 care Paper Trade Journal. D-19

WANTED—PAPER MILL MECHANIC who has had experience setting up paper machines and beaters. Good opportunity for capable man to work into permanent position as plant engineer for small tissue mill located in Southern New York State. Address Box 46-782 care Paper Trade Journal. TF

LARGE COURSE PAPER MERCHANT, requires the services of an aggressive and experienced man to handle purchase and sales. Excellent opportunity for the right man. Address Box 46-824 care Paper Trade Journal. N-28

CLASSIFIED ADVERTISING

HELP WANTED—5c a word. Double rate for heavy face type. Minimum charge $1.25.

SITUATIONS WANTED—5c a word, double rate for heavy face type. Minimum charge $1.25. If repeated ½ rate will be charged for each consecutive repetition.

FOR SALE—5c a word. Double rate for heavy face type. Minimum charge $1.25.

WANTED—5c a word. Double rate for heavy face type. Minimum charge $1.25.

OPPORTUNITIES—5c a word. Double rate for heavy face type. Minimum charge $1.25.

Classified advertising space may also be purchased at $3.00 per single column inch.

All classified advertisements are payable in advance.

If box number is used—35 cents additional.

Address Replies

to advertisements appearing under Box Numbers in care of
PAPER TRADE JOURNAL
15 West 47th Street
New York 19, N. Y.

HELP WANTED

CHARLES P. RAYMOND SERVICE, Inc.
294 Washington St., Boston, Mass.
Specializing in Paper Mill Personnel
Positions Now Open.

Manager or superintendent, also machine and back tenders for fast running news print mill, foreign country
Boss finisher, groundwood papers, $4,000
Mechanical engineer $400-450 month
Chemical Engineer
Master mechanic and assistant master mechanic
Paper and pulp mill designers and draftsmen
Back tenders
Beater engineers and many others

We invite correspondence (Strictly Confidential) with paper and pulp mill executives seeking new positions and with employers seeking new personnel. N-28

Specialty Bag Foreman

We are an established manufacturer opening a new department in which we will begin to manufacture Specialty Bags, using all new equipment, beginning in January. We seek an aggressive, intelligent and experienced Specialty Bag man capable of handling all manufacturing problems in this new division of our business. This man must have a thorough knowledge of bag machines and printing. He must be able to handle personnel well. To such a man we offer an attractive beginning salary plus an opportunity limited only to ability to produce. State age, education, complete experience and how soon available. All replies held in strict confidence. Write or Wire box 46-822 c/o Paper Trade Journal. D-21

WANTED for a short assignment—a steam engineer who thoroughly understands drying paper and all the controls needed to dry coated paper and the adjustment of same. In letter of reply give full experience and training to Box 46-829 care Paper Trade Journal. N-28

PAPER MILL SUPERINTENDENT—General superintendent for large self contained Bond and Sulphite specialty mill located in northern New England. Must have highest qualifications. Write giving complete details as well as salary desired and when available. Address Box 46-828 care Paper Trade Journal. N-28

MASTER MECHANIC—For tissue mill located Northern New York. Must have high qualifications and recommendations. Write giving full details as to experience, salary expected and when available. Address Box 46-827 care Paper Trade Journal. N-28

WANTED—Chemical Engineer for development and research laboratory. Prefer man with experience in fields of coating, printing and laminating for quality converting plant located in Midwest. Responsible position with excellent future. Address Box 46-821 care Paper Trade Journal. D-5

SITUATIONS WANTED

Director of Pulp Research and Development

available next spring. More than twenty years activity in the industry; specialty dissolving pulps and sulfate pulp bleaching. Will also consider Canada. Salary $10,000 minimum depending on living condition. Address Box 46-811 care Paper Trade Journal. D-7

EUROPEAN PAPER EXPERT—20 years experience, M. Sc. diploma Prague, seeks connection with paper mill. Efficient administrator to rebuild and maintain plant. Now working as Chief Engineer in India. Address Box 46-794 care Paper Trade Journal. N-28

PLANT MANAGER—thorough experience in converting paper and boards; wants change to position offering better opportunity. Excellent production and labor relations background. Address Box 46-694 care Paper Trade Journal. N-28

POSITION WANTED — SALESMAN of fine papers, many years experience in metropolitan territory. At present employed. Good list of well rated accounts that need paper. Address Box 46-796 care Paper Trade Journal. N-28

SITUATIONS WANTED

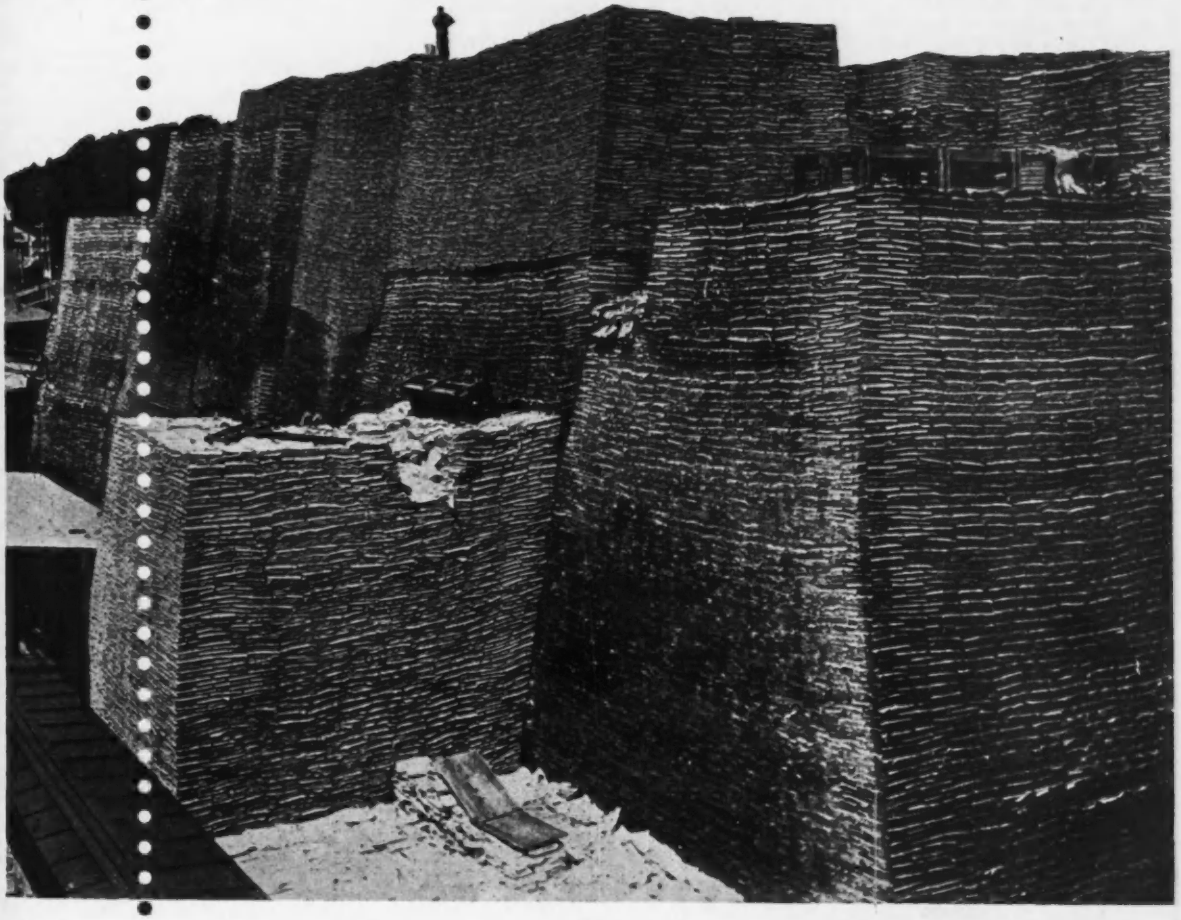
SUCCESSFUL BOXBOARD SALESMAN — Many years experience, both mill and selling on road, now available. Address Box 46-826 care Paper Trade Journal. D-19

FOR SALE

FOR SALE—One 60" dia. x 54" face steel plate surface dryer drum. Surface ½" thick. 9" journals. Address Box 46-818 care Paper Trade Journal. D-12

FOR SALE—64" Seybold Twentieth Century Cutter, guaranteed to be in fine working order. Address Box 46-836 care Paper Trade Journal. N-28

.....two fair questions to HYDRAPULPER-LESS MILLS

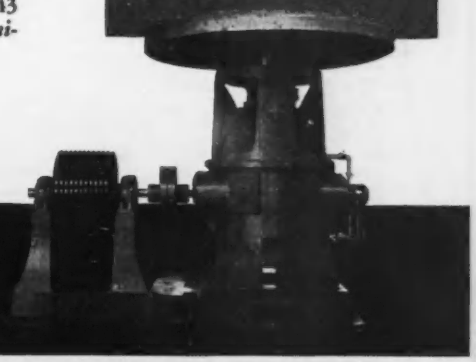


1. ***Can you, with your present equipment, pulp the 25,000 tons of pulp shown above in 143 days?*** **You could if you had a 20′ Hydrapulper!**

2. **Assuming that you can pulp 25,000 tons of stock in 143 days with other equipment,** ***can you pulp it thoroughly, uniformly and economically at that speed?***

If your answer to the above questions is "No," have us send you the rest of the Hydrapulper story.

Hydrapulpers now come with the new Shartle-Dilts sturdy, powerful spiral bevel or hypoid drive.



TUB SIZES: Hydrapulpers are built in 3′ to 20′ tub sizes.

SHARTLE BROS. MACHINE CO.
MIDDLETOWN, OHIO
DILTS MACHINE WORKS, FULTON, NEW YORK
Divisions of The Black-Clawson Co., Hamilton, Ohio
Associate: Alexander Flesk Limited, Ottawa, Ontario, Canada
THE BLACK-CLAWSON CO. (ENGLAND) LIMITED, MORDEN, ENGLAND

FOR SALE

FOR IMMEDIATE DISPOSAL

400 HP Harris Corliss Steam Engine in good condition.

Complete Mechanical Power Transmission Equipment, including Philadelphia Geared Reducer, 125 HP, Ratio 1⅔ to 1, in good condition and over 100 pulleys of various sizes.

2 Complete Paper Machine Drives in operative condition.

2 Moore & White Paper Machine Drives in good condition.

This equipment can be inspected at any time.

MAKE US AN OFFER

GOLDEN FLEECE CO., INC.

Bancroft, Mass. TF

FOR SALE

PAPER MILL EQUIPMENT FOR SALE

110" Hamblet & 80" Finley Sheeters.
68" Rice, Barton, Fales Slitter-Rewinder.
34" Inman shear cut Slitter.
Kidder Rotary Press, 4 colors one side, two on reverse, 34" cut.
54" Brown & Carver hand clamp Power Cutter.
14 x 22 John Thomsen.
36" Burton heavy duty Rotary Perforator.
American heavy duty Cross-Cut Saw.
Baling Presses—NEW—Both hand & power.

THOMAS W. HALL COMPANY, Inc.
120 West 42nd St., New York (18)
TF

FOR SALE—Cellophane. Available in small cut size sheets, either moistureproof or plain. Fairly prompt delivery. Address Box 46-683 care Paper Trade Journal. TF

FOR SALE—1 Hamilton-Corliss Variable Speed Twin Engine, size of cylinders 12" x 24". Also Triple-Deck Frames for ninety 36" dryers, any width. The Chesapeake Paperboard Co., Baltimore 30, Md. TF

FOR SALE

FOR SALE

62" Beloit Cut-Off Knife for Paster or Corrugator with Slitters
63" Langston Single Face Corrugator
60" Clark Aiken Sheeter
96" Guillotine Board Cutter
56" and 43" Miehle Print Presses
66" x 46" Sheridan 4 Post Die Cutter Model 25
ALSO SLITTERS; REWINDERS; PAPER CUTTERS; COATERS; PRINTERS; DIE CUTTERS; WINDOW CELLOPHANE GLUERS; SCORERS; CREASERS; STITCHERS; STAYERS; ENDERS; SLOTTERS; WRAPPERS & GLUERS.
Write for Bulletins listing over 70 PAPER BOX and CONVERTING MACHINES now available.

SOUTH WABASH ENGINEERING CO.
2929 S. Wabash Ave., Chicago, Illinois
J-2

FOR SALE—One 38" two color Rotogravure Press. Sheet feed and pile delivery. Practically new. Address Box 46-541 care Paper Trade Journal. TF

FOR SALE—51" "Perfecta" Power Paper Cutter. Automatic clamp—power driven knife gauge and automatic spacer. Complete. Good condition. Immediate delivery. Address Box 46-834 care Paper Trade Journal. N 28

FOR SALE

BEATERS
1—2000 lb. Holyoke-Iron Tub Beater.
8—1200 lb. E. D. Jones (no tubs).
1—1000 lb. Dayton Beater (no tub).
1—400 lb. Gavit—iron tub beater.
1—Dilts Breaker Beater—Bandless Roll 62" diameter x 54" face—70 tons daily capacity. Equipped with Shartle Bros. Ragger.

BLOWERS
8—Buffalo Forge Company—Size 7—Duplex Conoidal steel plate Blowers. Ball bearing.

CALENDER STACKS
1—5 roll 84" face—Farrel.
1—6 roll—72" face.
1—7-roll 36" Holyoke Machine (supercalender).
1—2 roll 24" laboratory calender stack.

CENTRAP
1—Shartle Brothers Centrap.

COATING MACHINE
1—26" six roll coating machine.

CREPING MACHINE
1—86" Waldron Creping Machine, practically new. Could be used for laminating.

CYLINDER MOULDS
1—30" diameter x 74" face.
2—30" diameter x 54" face.
1—30" diameter x 75" face.
1—36" diameter x 84" face.
1—36" diameter x 80" face.
2—36" diameter x 72" face.
5—30" diameter x 72" face.

DOCTORS
14—Dillon Doctors—complete with accessories—98" face.

DRIVES
1—40 h.p. Bagley & Sewall, enclosed drive.
2—30 h.p. Downingtown, enclosed drives, ratio 6 to 1.
1—Cleveland Worm Drive, Ratio 10 to 1, New.
4—Smith & Winchester mortise gear Drives.
1—Moore & White mortise gear drive.
1—D. O. James 75 H.P. Speed Reducer with couplings and motor base. Ratio 2.16 to 1. 900 RPM.
1—#7½ Reeves Drive.

DRYERS
16—36" diameter x 115" face. (Gears & Bearings).
1—28" diameter x 76" face.
1—48" diameter x 94" face.
1—24" diameter x 84" face. (Baby).
2—36" diameter x 64" face, with frames gears and bearings.
2—25" x 120" (Baby Dryers).
1—48" x 100".
1—36" diameter x 38" face.
5—48 x 72.
2—36 x 74. Bearings & new gears.
2—36 x 76. (Bronze). Bearings & new gears.

DRYERS
1—24 x 74 (Stainless steel).
3—24 x 72 (Copper face, textile type).
1—24 x 70 (Baby dryer).

ERKENSATORS
2—I. W. E. Erkensators—bronze construction—complete with motors, starters and distributing box.

FLAT SCREEN
1—4 plate Flat Screen.

HYDRAULIC PRESSES
1—Lake Erie Engineering Co., 78 ton, platen 12" x 12".
1—Watson Stillman, 60 ton, platen 14" x 14", with triplex pump and motor.

JORDANS
1—#2 Emerson, with 125 h.p. motor.
2—Noble & Wood, Pony Monarch, Belt Driven.
1—No. 9 Emerson Jordan—for direct connection to a motor.
1—Noble and Wood, Monarch, new fillings.

LIGHTER BAR LIFTS
3 sets Hydraulic Lighter Bar Lifts, with pump.

MOTOR
1—25 h.p. motor, including starting equipment.

PULLEYS
Various cone and assorted pulleys.

PULP EQUIPMENT
1—32" three pocket Glens Falls Grinder (for 27" wood).

PULP SCREEN
1—IMPCO centrifugal pulp screen design No. 3.

PULPER
1—Jones Pulper.

PULVERIZER
1—Erie coal pulverizer.

PUMPS
1—Buffalo Pump—5500 g.p.m. direct connected to 100 H.P. Motor (50' head).
Various sizes of Centrifugal and Plunger Pumps. Write us regarding your particular requirements.
4—Vertical Schutte & Koerting Acid Pumps (with motors).

REELS
1—72" Downingtown Expansion Reel.
1—2 Bowl Reel — 112" face — bowls 30" diameter.
1—2 Bowl Reel—110" face.

ROLLS
500—Brass tube—steel tube—rubber covered iron rolls—various sizes.

ROTARY SCREENS
3—Moore & White Rotary Screens (alternating diaphragm type).

ROTARY SCREEN
1—#2 Bird Screen (copper vat).

SAVEALL
1—Saveall 36" diameter x 96" face cylinder mold. (With iron end vat.)

SCREEN PLATES
36 plates—43 x 11⅛"—.050 cut—bevel edges.
24 plates—Recently recut .008.
12 plates—Recently recut .035.
Also other sizes and cuts in stock.

SHREDDERS
1—No. 25 CRSE Mitts & Merrill Hog.
1—Gilman Shredder.
1—Waterville Shredder.

SHEETERS
1—128" Moore & White Sheeter with layboy.
1—48" Langston heavy duty chopper (this is a combination machine, combining a slitter, scorer, sheeter and chopper.)
1—64" Hamblet Sheeter, layboy and 10 roll backstand.

SLITTERS AND WINDERS
1—72" Langston.
1—36" Beck Razor Blade type Slitter & Winder.
1—60" Moore & White Slitter and Winder set for 5/16" slits.
1—60" Moore & White Slitter and Winder set for 7/16" slits.
1—32" Cameron, Type 6.

STOCK PUMPS
1—8 x 12 duplex Moore & White.
1—12 x 20 Triplex Shartle
1—10 x 12 open impeller. (All lead).
5—Goulds Centrifugal Stock Pumps, 4 x 6, ball bearing.
2—10 x 20 Shartle Brothers Triplex.
1—8 x 12 Moore & White Triplex.
Numerous other Centrifugal Stock Pumps Advise as to your requirements.

SUCTION FELT ROLL
1—Nash 110" Suction Felt Roll.

TOILET AND TOWEL MACHINES
1—65" Towel Machine.
1—85" Toilet Machine.

TRIMMER
1—50" Seybold Trimmer.

V-BELT DRIVES
1—{23" diameter x 14" face, 10 grooves.
{15" diameter x 14" face, 10 grooves.

VACUUM PUMPS
2—#4 Nash Hytor.
1—No. 7 Sturtevant Vacuum Pump.
2—14 x 20 Connersville.

VALVES
7—8" Quick Opening Stock Valves.
4—6" Quick Opening Stock Valves.

WET MACHINE
1—74" Moore & White.

We are always in the market to purchase your surplus or idle machinery. What have you to offer? Wanted Cylinder and Fourdrinier Machines (complete mills).

Paddy Ross, Pres. **J. J. ROSS COMPANY** Ben Kurs, Treas.

250 Frelinghuysen Ave. **Tel.—Bigelow 3-3720** **Newark 5, N. J.**

TELEPHONE
HUMBOLDT 2-2177

CABLE ADDRESS: JACK ROSS

ROSS PAPER MACHINERY CO.

265 PASSAIC STREET
NEWARK 4, N. J.

CONVERTING
PAPER MAKING EQUIPMENT

NEW, USED, REBUILT
PAPER AND PULP MACHINERY

JACK ROSS, President

AIR HOISTS
2—Two-Ton Ingersoll Rand
2—Five-Ton Ingersoll Rand

BEATERS
2—1000 lb. Horne Iron Tub.
3—1200 lb. E. D. Jones Iron Tub Beaters with washers.
2—1200 lb. E. D. Jones Beater—no tubs.
3—Valley Iron 750 lbs. Iron Tub Beaters, with Silent Link Belt Drive.
1—1200 lb. Noble and Wood—no tub. Spare new fillings for roll.
2—Valley Iron—Roll 67" diameter x 60" face—wood tub.

BIRD SCREEN PLATE
17 Plate—60 cut. New condition.

BLEACHERS
2—Fletcher high density bleachers—used 3 months.

BLOWERS
1—American ball bearing blower, size 17" x 23" for motor drive.

CALENDER DOCTORS
1 set of 16 Warren Doctors 104" face with frames.
80 Warren Doctors—various sizes.

CALENDER ROLLS
36 rolls various sizes

CALENDER STACKS
2—2 roll Holyoke 36" face
1—Pusey & Jones 9 roll 64" face.

CONVERTING EQUIPMENT
2—Sanitary Napkin Machines. With motors and starters.
1—Bliss Double Head Stitcher.

COUCH ROLLS
2—18" diameter x 92" face—brass covered.
3—20" diameter x 92" face—brass covered.

CYLINDER MOLDS
2—Impco—84" face—40" diameter with stainless steel face wire
2—110" face x 58" dia.
4—84" face x 30" diameter.

DANDY ROLLS
1—122" face 10" dia.
1—138" face 12" dia.
1—129" face 9½" dia.

DRYER DOCTORS
40—Warren Doctors. Various sizes.

DRYERS
36—48" Dia. x 48" Face, Chromium Plated.
2—24" Dia. x 48" Face.
13—120" face x 48" diameter—New
1—100" face x 48" diameter—with ball bearing.
8—52" face x 27" diameter.

ELECTRIC HOIST
1—Sprague Electric 3 ton hoist—5 h.p. 3 phase—60 cycle—110 volts.

FLAT SCREENS
3—Harmon 16 plate.
1—Sandy Hill 2 plate flat screen.
1—6 plate Packer—Roller shoes.

FOURDRINIER SHAKES
1—Beloit Fourdrinier Shakes.
1—Sandy Hill Bertram Shake. Late type.

FOURDRINIER WET END
1—120" Beloit Fourdrinier Wet End.
1—74" Pusey & Jones Wet End.

GRANITE ROLLS
1—112" face 20" diameter.

HAMMERMILLS
1—American Hammermill—37" anti friction bearing equipped.
1—Williams 18" Hammermill Ball Bearing.

HOG
1—Mitts & Merrill Hog. Number 5Z52.

JORDANS
1—E. D. Jones Imperial Jordans—belt driven.
1—Smith & Winchester 30 ton capacity—belt driven.
1—E. D. Jones Imperial Jordan with 200 h.p., —360 r.p.m. motor.
1—Jones Standard

KNOTTERS
1—Wells Knotter.
2—Trimbey Knotters.

LINE SHAFT
1—Complete line shaft with pulleys and pillar block.

PLATERS
2—Holyoke 2 Roll 18" dia. 36" face.

PULLEYS
60—Cone Split and Solid Cast Iron Pulleys. Various Sizes.

PULP EQUIPMENT
1—126" face Kamyr Press.
1—84" Sumner Disc Barker with motor
1—84" Carthage 4 knife chipper, 3 sets spare knives with one Waterville Rechipper.
2—IMPCO Pulp Screens
2—Trimbey Knotters
2—Apmew Pulp Screens

PULPERS
1—Voith Pulper 20 tons cap.
1—Bird Pulper.

PUMPS
3—Ingersoll Rand 230 g.p.m. 1740 rpm 90' head —4" suction—3" discharge. Direct connected to 10 hp. General Electric 220-440 volt—3 phase—60 cycle motor.
2—Ingersoll Rand 500 g.p.m. 1745 r.p.m.—80' head—4" suction—3" discharge. Connected to 15 h.p. General Electric 220-440 volt—3 phase—60 cycle motor.
4—Worthington Pumps 10,000 g.p.m.—35' head. Requires 75 h.p. at 550 r.p.m.
1—DeLaval 6" x 6".
6—Warren Vertical Pumps. 6" suction. 3" discharge. 135 g.p.m. 60' head. Direct Connected 6 h.p. General Electric motor. 1750 r.p.m. 440 volts. 3 ph.-60 cycle, ball bearing.
2—Worthington 3", 2 stage, 200 g.p.m. 224' head. Bronze Ball Bearings.
1—Worthington 400 g.p.m. 35' head 1750 r.p.m. Ball bearing.
1—Gould Figure 3000—size 8-4" suction—3" discharge.
1—American Marsh 200 g.p.m.—50' head—3" suction 2½" discharge.
1—Pennsylvania 1000 g.p.m. 80' head—8" suction—6" discharge—Connected to 30 h.p. G.E.—220 v. 3 phase—60 cycle motor.
6—De Laval Verticals—540 g.p.m. 1740 r.p.m. —30' head 5" x 5". Direct connected to 7½ h.p. Allis Chalmers Motor. 440 volts—3 phase—60 cycle.
1—6" Pusey & Jones Open Impeller Centrifugal Stock Pump—belt driven.
1—7" Pusey & Jones Open Impeller Centrifugal Stock Pump—belt driven.
1—Worthington 750 g.p.m. 120# head.
3—3" Lance Size Pumps—belt driven.
1—La Courtney 4 stage, 1000 g.p.m., 1750 r.p.m., 750' head. With base and couplings for motor.
1—La Courtney 6 stage 1200 g.p.m., 1760 r.p.m., 1100' head, with base and couplings for motor.
10—Water Pumping Units, 500 g.p.m., 270' head. 2400 r.p.m. Driven by a Chrysler Crown Gasoline Engine and mounted on a two wheel trailer.
1—Terry Marsh 750 g.p.m., 250' head. Requires 125 h.p. motor.
2—Ingersoll Rand all bronze 175 g.p.m.—40' head.
1—Worthington 3"—200 g.p.m.—3550 r.p.m.—480' head.

REFINERS
1—Weiner Refiner 24" with extended base for direct connection to motor.

ROLLS
40—Table, Dress, Felt, Wire, Breast and Calender Rolls. Various Sizes.

ROTARY COOKER
1—Rotary Cooker—6' dia. x 21' long—complete with drive.

ROTARY SCREENS
2—#2 Bird with copper vats.
2—#1 Bird with steel vats, lead lined.
4—Moore & White.

RUBBER PRESS ROLLS
1—100" Face—17½" Diameter.
1—120" Face—19" Diameter.
1—107" Face—18" Diameter.
1—106" Face—18½" Diameter.

SAVEALLS
1—A. D. Wood cylinder 42" dia. 60" face.

SCREW PRESS
1—Valley Iron Screw Press. Used 2 years.

SHEETERS
1—96" Hamblet Duplex.
1—90" Beloit Single Knife heavy duty.
1—136" Hamblet Duplex.

SHREDDERS
2—24" Sprout Waldron heavy duty shredders—anti friction bearing equipped.
1—Taylor Stiles Portable Pulp Shredder—on wheels.
1—Rythor and Pringle Shredder.

SLITTERS AND WINDERS
1—41" Waldron Slitter and rewinder. Roll embossing attachment.

STEAM LOCOMOTIVES & WOODLAND EQUIPMENT
1—32 ton 36" gauge Shay-Lima locomotive. Air pressure 150 lbs. P.S.I. with a large lot of new spare parts.
1—40 ton 36" gauge Improved Climax Locomotive, Boiler pressure 150 lbs. P.S.I. with a large lot of new spare parts.
30—36" gauge wood cars. 40,000 lbs. log or pulpwood capacity. Used 4 months.
1—Sheffield motor car, manufactured by Fairbanks Morse—36" gauge—New.

STOCK PUMPS
1—8 x 10" Beloit Duplex.

STONITE PRESS ROLL
1—Stowe Woodward 111" face x 22" diameter.

SUPERCALENDER STACKS
1—9 roll Norwood 83" face. Bottom roll 24" diameter. Top roll 20" diameter.

TURBINES
1—Westinghouse 125 h.p. 125 steam pressure—15 back pressure. Complete. Used 1 year.

VACUUM PUMPS
2—14" x 20" Connersville.

YANKEE DRYERS
2—Beloit 8' dia. x 178" face—75# working pressure.
1—Beloit 5' dia. x 194" face—75# working pressure.

THE ABOVE IS A PARTIAL LIST OF EQUIPMENT OFFERED FOR SALE.

NO CONNECTION WITH ANY OTHER FIRM OF SIMILAR NAME.

FOR SALE

1—54" Seybold Holyoke Mill Type Cutter. Independent, automatic clamp. Flat Power Back Gauge. 5 h.p. a.c. motor. Rebuilt and guaranteed.
1—Modern Clipper Cellophane Bag Machine.
1—92" Dillon Duplex Rotary Sheet Cutter with slitting attachment, Brannan Ream Folder and 25 roll backstands.
6—Potdevin and
1—Lockport flat and square bag machines, complete with motor equipments making bags from ¼ to 25 pounds.
1—84" Hamblet Standard Single Rotary Sheet Cutter with slitting attachment.
1—36" Norwood Plater. 15 h.p.—A.C. motor—pulley drive. Excellent condition.
1—Noble & Wood Pony Jordan with extra new filled plug. ⅛" steel fillings.
3—Lockport Flat and Square Bag Machines making bags from 4 to 24 lbs., also SOS Bag Machines making 1, 2, 3, 7, 8 & 10 lb. bags.
1—42" 3 roll Friction Calender, two steel rolls, one cotton roll.
1—52" 9 roll Holyoke Super Calender, 5 steel and 4 cotton rolls. Revolving reel and motor equipment. Push button control.
1—53" 7 roll Textile Machinery Co.'s Super Calender. Roller bearings. Revolving reel and motor equipment. Push button control.
1—52" Waldron Brush Coater. Festoon equipment, five Buffalo Blowers, winding reel. Motor equipments.
1—58" Crahl & Hoehl Brush Coater. Festoon equipment. Five Buffalo blowers. Winding reel. Motor equipments.
1—60" Waldron Brush Coater. Festoon equipment. Six Buffalo Blowers. Winding reel. Motor equipments.
1—64" Waldron Brush Coater. Festoon equipment. New J. O. Ross Drying Oven. 5 Buffalo Blowers. New winding reel. Motor equipments.
1—Sheridan Die Press 27x44"—rebuilt.
1—Logeman Die Press 10x30"—rebuilt.
4—Complete spiral tube winders with automatic cut-offs, also recutters. 2 Langston and 2 Knowlton manufacture.
6—Rotary Embossing Machines: 1—33", 4—34" and 1—44".

GIBBS-BROWER COMPANY, INC.
21 East 40th St., New York 16, N. Y.
TF

FOR SALE

5—Noble & Wood Monarch motor driven Jordans, plain bearings, with 5 Westinghouse 100 HP, 3 phase, 60 cycle, 440 volt gear type motors, 437 RPM output with starters.
4—Westinghouse Induction 125 H.P. 3 phase, 60 cycle, 440 volt, 385 RPM motors with starters
1—150 H.P. Westinghouse slip ring, 3 phase, 60 cycle, 440 volt motor, 435 RPM. Double end shaft. Drum control and resistors and starter.

SHARTLE BROS
Middletown, Ohio D-5

FOR SALE

FRANK H. DAVIS CO.,
ESTABLISHED 1889
USED AND REBUILT PAPER MACHINERY.

FOR SALE

BEATERS
2—Holyoke 66 x 60 iron tub
1—Holyoke 48 x 44 iron tub
1—Horne patent beater 60 x 60, bronze bars
1—2000 lb. Horne iron tub new 1941, bandless roll 60 x 48
CALENDERS
1—52" Textile seven roll supercalender
1—43" Holyoke seven roll supercalender
5—Paper rolls 76 x 15¾ Jour. 7¾ x 13¾"
CUTTERS
1—110" Hamblet duplex sheet cutter
1—84" Clark with Moore & White layboy
1—Taylor Stiles rag cutter
2—No. 2 Daniels rag cutters
1—63" Smith & Winchester undercut ream cutter
1—115" Single knife Moore & White cutter and slitter, also layboy
DECKERS
1—30 x 95" Black & Clawson
1—30 x 74" Impco
3—Apmew filters, mould 50 x 100"
DRIVES
6—Beloit 14 & 63 teeth
7" face C O mortise gears
DRYERS
1—8 ft. x 86"
2—8 ft. x 175"
1—6 ft. x 102"
1—5 ft. x 194" new 1939
1—6 ft. x 106"
DUSTERS
1—four cyl. R.R.
1—Devil
FANS
Two—Buffalo double turbo 6½ conceidal forced draft fans
ENGINES
1—Hamilton Corliss 10 x 30 direct connected to 30 KW Westinghouse engine generator including exciter, balance wheel 10 ft. x 11"
1—10 x 10 American Ball twin variable speed, 100 HP excellent condition
FOURDRINIER PARTS
1—119" x 54' 10" wire
Rice Barton anti friction equipped 18" breast and 18" suction couch, now running
1—120" x 75 ft. wire Horne new 1927, anti friction equipped 25" suction couch and Beilit oscillating suction boxes. Also two sets Horne heavy grasses with 20" dia. rolls. Now running 450 FPM
1—133" x 61' 2" wire Pusey & Jones, plain couches, running at 500 FPM
1—100" x 31 ft. special with two Reeves drives
1—72" Sandy Hill
1—120" Voith inlet
2—Sets 10" slices
FILTERS OR DE-INKERS
1—Apmew three cylinder, mould 50 x 100", worm gear drive
MIXERS AND COOKERS
1—25 gallon cooker, No. 75
PULPERS
1—No. 1 Lanneye
2—Jones with Falk reducers and motors 440 volts 3 ph sixty cycle
PUMPS
1—10 x 10 Beilit triplex
2—10 x 12 Deane rebuilt
1—Ingersoll Rand Pump, type Imperial 10
REELS
1—Two bowl Beloit, drums steel 16 x 123, slip belt drive
SCREENS
2—No. 2A Bird
2—No. 2 Bird
1—Moore & White No. 3
1—Jones Leith Walk
2—12 plate Packer
4—New 10 plate Witham vats
SHREDDERS
2—Mitts Merrill No. 15 CF direct cont. to 125 HP 440 volt motor
1—Carthage
Mitts Merrill type 14A F E S No. C 19026
SORTING TABLE
1—Moore & White sorting table
SLITTERS AND WINDERS
1—150" Moore & White four drum
1—120" Kidder two drum
1—114" Moore & White winds 80" roll
1—84" Bagley & Sewall
1—80" Cannard
1—26" Kidder two drum
1—30" Langston
WASHERS
2—2000 lb. Union Machine steel tub
Apmew three cylinder
WET MACHINES
1—84" Noble & Wood, automatic cut off
Bottom roll R.C. 24 x 88"

Builders of
ASPHALT COATING, COMBINING MACHINE, GUMMING AND CREPING MACHINE, ROLL GRINDER
FRANK H. DAVIS COMPANY
175 Richdale Ave., Cambridge, Mass.
TF

FOR SALE

REVAMPING AND REBUILDING MILL AND CAN OFFER FOR SALE

Carrick Combustion controls for two boilers to be sold as unit.
1—Noble & Wood Mammoth Jr. Jordan ¼" Filling.
1—Brass covered finishing press roll 17¾" dia. x 88½" face complete with bearings and Noble & Wood friction drive.
1—4000# capacity motor driven freight elevator with automatic stop control—can be inspected in operation at our plant.
2—8" Barnes centrifugal sewage pumps.
10—100" screen plates for No. 2-A Bird Screen, Slots .022—never used after being recut once.
1—Brass covered press roll 11½" dia x 68" face—journals 4-13/16" dia. x 7½" long.
1—Rubber covered press roll 13" dia. x 86¼" face—journals 4-15/16" dia. x 10¼" long.
11—20" face cast iron tapered pulley—2-15/16" bore, taper 31"-29½"
2—20" face cast iron tapered pulleys—3-7/16" bore, taper 31"-30"
1—20" face cast iron tapered pulley—3-15/16" bore, taper 30"-28½"
1—24" face cast iron tapered pulley—3-7/16" bore, taper 31⅝"-29⅝"
2—Steel split pulleys 60" dia. x 31" face x 5-15/16" bore.
2—Steel split pulleys 60" dia. x 41" face x 5-15/16" bore.
1—Cast iron split pulley 50" dia. x 21" face x 3½" bore.
1—Cast iron split pulley 40½" dia. x 21" face x 3½" bore.
1—Cast iron split pulley 84" dia. x 36" face x 5-15/16" bore.
1—Cast iron split pulley 72" dia. x 16" face x 8⅜" bore.
1—Paper pulley 24" dia. x 21" face x 4½" bore.
1—9½" dia. x 85" face rubber covered squeeze or wringer roll—Journals 1-15/16" dia.
1—9" dia. x 88" face calender roll—5" dia. journals.
12—6½" dia. x 92" face steel drier felt rolls with 1-7/16" x 6½" journals.
2—Pair Noble & Wood lighter stands complete with lighter beams and bearings for 8" dia. journal beater roll.
1—Rubber covered roll 17¾" dia. x 88" face, journals 4⅜" dia. x 9" long with Noble & Wood friction drive.

A visit to the mill would prove profitable as we have many items for sale too numerous to mention. See our superintendent, Mr. O. P. Fussell at our plant in Walloomsac, N. Y.

WALLOOMSAC PAPER MILLS, INC.
Mills: Walloomsac, New York
Main Office: 25 Vanderbilt Avenue
New York 17, N. Y.
TF

FOR SALE

DILTS BREAKER BEATER

Bandless Roll 62" diameter x 54" face—70 tons daily capacity.
Equipped with Shartle Bros. Ragger.

J. J. ROSS COMPANY
250 Frelinghuysen Ave., Newark 5, N. J.
Tel. Bigelow 3-3720 N-28

FOR SALE

2—Keyed Bandless Beater Rolls, complete with stands, 66 heat-treated corrugated fly bars. These rolls are like new in all respects.
1—2000# cast iron tub available.
1—Dilts Rag Stock Beater, 1000# capacity, Keyed type roll 50" dia. 48" face. New heat-treated bars and new woods.
1—Dilts new type 2000# Beater with cast iron tub. Roll, keyed bandless type, also 1-Cylinder Washer.
1—Horne patented type 1500# capacity Beater with 4" cypress tub. Used very little.
3—Dilts Hydrafiners, 1800 RPM type. Fully reconditioned, new bearings.
1—Weiner Refiner, used very little.
1—Shartle Classifiner, used about 2 years.

OSBORNE PAPER MILL EQUIPMENT CO.
FULTON, N. Y.
N-28

FOR SALE

MACHINERY FOR SALE

3—Impco Pulp Screens of design No. 3.

3—Gould, size 8", double suction centrifugal pumps mounted on baseplates but without motors. These pumps are Fig. 3450, rated 1600 GPM at 25 ft. head and require a 15 HP 1200 RPM motor. One pump is new and one pump is slightly used but in good condition.

3—Garanac Oyster-pail machines, hopper feed.

3—Garanac Butter-dish machines, hopper feed.

STEVENS & THOMPSON PAPER COMPANY
Greenwich, New York TF

FOR SALE

Two—12 plate Bagley & Sewall flat screens in good condition.

One—120" heavy duty Langston Winder.

Both can be seen running until January 1st.

MUSKINGUM FIBER PRODUCTS CORP.
Coshocton, Ohio D-21

FOR SALE
NEW AND COMPLETE

Steam Power Plant Equipment, consisting of 2—80000 lbs. per hour 625 psig pulverized coal fired boilers with pulverizers; fans; feed water heater; pumps and controls; dust collector system; pneumatic ash conveyor system; motors and turbine drives. Also 1—5000 Kw bleeder type turbo generator 600 psig initial, extracting at 150 psig and 20 psig, with 4000 sq. ft. surface condenser and 2—2000 Kva transformers and switch gear. Address Box 46-815 care Paper Trade Journal D-12

FOR SALE

1—Complete Paper Machine 48" wide, trim 45". 17 Dryers, Calender Stack, Cameron Winder, Pumps, Beaters, Jordans, etc. About 12 tons daily capacity. Immediate delivery. Price very reasonable.

OSBORNE PAPER MILL EQUIPMENT CO.
Fulton, N. Y. N-28

FOR SALE

2—Brownell Twin High Pressure Engines — 250 h.p. each — 260 r.p.m.—size 14 x 16".

1—Hamilton Corliss Engine—200 at 120 r.p.m. size 18 x 36".

1—Fulton Iron Works Corliss Engine—200 h.p. at 100 r.p.m. size 14 x 42 engines.

J. J. ROSS COMPANY
250 Frelinghuysen Ave. Newark 5, N. J.
Tel. Bigelow 3-3720
N-28

FOR SALE

New brass covered felt or wire rolls 6½" dia., 84 to 120" face. These are made from government surplus and are new in all respects.

Osborne Paper Mill Equipment Co.
Fulton, N. Y. TF

FOR SALE

1—86" Waldron Creping Machine Practically new. Could be used for laminating.

J. J. ROSS COMPANY
250 Frelinghuysen Ave., Newark 5, N. J.
Tel. Bigelow 3-3720 N-28

FOR SALE

PAPER COATING MACHINERY — Waxing, Oiling, Gumming, Gluing, Carbon, Laboratory Coating and Treating Machines. High speed. New improvement. MAYER MACHINE COMPANY, Inc., 1155 Scottsville Road, Rochester, 11, N. Y. TF

FOR SALE—1—Economy 1,000# Capacity Electric Tiering Machine; 1—Economy 1,500# Capacity Electric Tiering Machine. Both equipped with: 3 h.p., 230 Volt, D-C Roth Motor. Address Box 46-726 care Paper Trade Journal. D-12

FOR SALE

FOR SALE—Knowlton Spiral Winder complete with motors, tube cutters, roll slitter and other paper tube machinery—immediate shipment. Theo. Adams, 111 W. Washington St., Chicago, Ill. N-28

FOR SALE — 2 — Quadruple Effect Vertical Body Evoporators; 3—Rotary Dryers, 7½' x 65', 7' x 70', 7½' x 130'; 2 Rotary Digesters. Full details upon request. BRILL EQUIPMENT COMPANY, 225 West 34th Street, New York, 1, N. Y. D-5

WANTED

WANTED

WANT TO PURCHASE

A party is interested in purchasing a paper jobbing business having an established trade, located preferably in the East. Arrangements could possibly be made to continue present owner as manager and retain present employees. All information will be held in strict confidence. Address Box 46-833 care Paper Trade Journal. D-5

MACHINERY WANTED

2 or less Cylinder Molds 36" dia. 80" face 20" Journal 2⅞" with Anti-friction Bearings.

MIAMI PAPER BOARD MILLS, INC.
Box 66, Miami Springs, Fla.
D-12

Wanted By Converter

Kraft, Sulphite and Ground Wood papers in rolls. 15" to 120" widths, Basis 25# up to 100#. Can take up to 40" Diameter.

Write or phone

CAMOTONE, INC.
551 Fifth Ave., New York 17, N. Y.
N-28

WANTED

Need M F Book and Litho Paper or Paper Board .065 and .125 for exchange of 48"—.016 and .22 Imitation Kraft—P. O. Box 189, York, Pa. N-28

WANTED

Ground wood plant for 10 to 12 tons for shipment to foreign country, or will consider grinder and motor.

SHARTLE BROS. MACHINE CO.
Middletown, Ohio D-5

WANTED

Side rolls odd lots of any kind of paper in rolls 12½" and wider any color, preferably white, also printed with any design. All grades.

Contact

GEORGE S. BLEYER
BLEYCO PAPER CORP.
214 Sullivan St., New York #12
D-26

WANTED

Coating machine to handle roll stock 72" wide, preferably Waldron Reverse Roll Coater. Address Box 46-830 care Paper Trade Journal.
N-28

EXPORT

WANTED—New or used paper working and allied machinery for export.

POTDEVIN EXPORT CORPORATION
1223 38th St., Brooklyn 18, N. Y.
D-12

PAPER MANUFACTURER desires to purchase or invest in converting business of standard paper products. Address Box 46-708 care Paper Trade Journal. TF

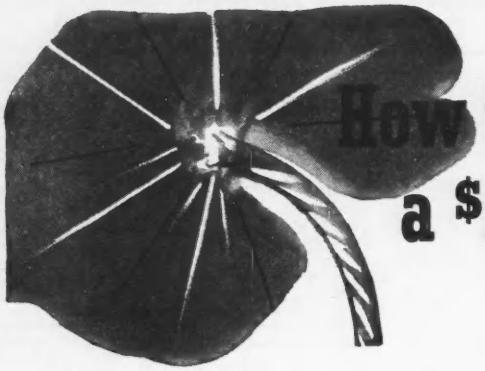
WANTED — W & P Shredders, Evaporators, Generators and Boilers, Slitters, Cutters, Hydraulic Presses, Sheridan Presses, Dryers. Address Box 46-32 care Paper Trade Journal. TF

WANTED — DISCARDED PAPER MILL FELTS. HIGHEST PRICES paid for all kinds of discarded paper mill felts. LARGE or SMALL QUANTITIES accepted. Prices quoted immediately on receipt of samples. ADDRESS: GLASER AND YOFFE, INC., 80 NORTH MAIN ST., NATICK, MASS. TF

WANTED—Paper Board Machine, capable of producing 35 to 100 tons folding box board daily. Replies held in strictest confidence. Address Box 46-651 care Paper Trade Journal. TF

WANTED—Guillotine Cutter, also Beck sheet cutter any size. Address Box 46-825 care Paper Trade Journal. D-5

WANTED—SHEETER, approximately 50" new or used, advise condition, age, specification and how many sheets per minute, and price. Address Box 46-781 care Paper Trade Journal. N-28



How to Pull the Fuse from a $20,000,000,000 Bomb

IMAGINE a super bomb whose explosion could rock the entire nation. Such a bomb EXISTS—*but you can help render it harmless.*

This bomb is $20,000,000,000 surplus national income.

Authorities estimate that this year's total income will be $155,000,000,000—personal taxes will total $15,000-000,000—consumer goods and services will absorb no more than $120,000,000,000. This leaves $20,000,000,000. Even if banks and insurance companies absorb one-fifth of the surplus (as they did in 1945), there will still remain $16,000,000,000 that could be used to bid up prices.

You're doing yourself, your company, and your country a favor by continuing your payroll deduction plan for the regular purchase of U. S. Savings Bonds. At maturity, they pay $4 for every $3 invested!

THE PEACETIME PAYROLL SAVINGS PLAN—

A booklet, published for key executives by the Treasury Department, containing helpful suggestions on the conduct of your payroll savings plan for U. S. Savings Bonds.

THIS TIME IT'S FOR YOU

A booklet for employees . . . explaining graphically how the payroll savings plan works . . . goals to save for, and how to reach them with Savings Bonds.

Are you using these booklets?

If not, or if you want additional copies, just ask your State Director of the Treasury Department Savings Bonds Division.

The Treasury Department acknowledges with appreciation the publication of this message by

PAPER TRADE JOURNAL

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and the Advertising Council

WANTED

WANTED—Brightwood Box Machine. Address Box 46-33 care Paper Trade Journal. TF

WANTED—Complete equipment for Paraffining Boxboard, with refrigerating and heating unit. Address Box 46-812 care Paper Trade Journal. N-28

WANTED—SEYBOLD CUTTERS with capacity of 44" or over, CAMERON ELECTRIC EYE SPOOLERS Model No. 24 or Model No. 2D, and KRAUSE DIE CUTTERS. Write or wire Reynolds Metals Co., Engineering Division, Richmond, Virginia. J-2

WANTED—COFFEE BAG MACHINE to make 1 lb. size Also Bag Presser. Address Box 46-831 care Paper Trade Journal. N-28

WANTED—Narrow size rolls .009 and .016 liner board, 3", 6" and 9" in width, 45" diameter—50 tons per month. Address Box 46-835 care Paper Trade Journal. N-28

SALES AGENCY

WELL ESTABLISHED FIRM in Shanghai, with years of experience in paper business desires to contact American Mills or exporters of paper, board or pulp; interested to be appointed agents in China. Write Paper Dept., P. O. Box 1172, Shanghai, China. D-12

BUSINESS OPPORTUNITY

SMALL PULP AND PAPER MILL to be built in Niagara River. Produce 25 to 30 tons Pulp, 10 tons Foudrinier Tissue. Want the following to participate in financing and operating mill. General Manager, Superintendent, Paper Converter or Jobber. Full particulars those seriously interested. Address Box 46-822 care Paper Trade Journal. N-28

MISCELLANEOUS

WILL EXCHANGE board for laminating, mounting, lining and die-cutting machinery. Address Box 46-707 care Paper Trade Journal. TF

The right man may be seeking a job in an advertisement in this section. The machine or the material you urgently need may be advertised right here in these columns. Read Them, Use Them—If you need something, advertise for it—If you have something to sell tell the industry about it—Everybody reads the Clearing House.

BLANKETS

Converted From Your Used Felts

Write for Full Details

BLOOMFIELD WOOLEN COMPANY
BLOOMFIELD, IND.

PULP MILL MACH'Y FINISHING ROOM MACH'Y
FRICTION CLUTCHES
The MOORE & WHITE Co.
PHILADELPHIA, PA.
N. PHILA. STA. PENNA. R.R.
PAPER MILL MACHINERY

Appleton Wires are Good wires
APPLETON WIRE WORKS, INC. APPLETON, WIS.

K-121-B DEINKING — DECOLORIZING and COOKING PROCESSES K-C-2
THE KINSLEY CHEMICAL COMPANY
12500 Berea Road Cleveland, Ohio

THE MAYER MACHINE COMPANY, INC.
Manufacturers of
Paper Coating Machines
1155 Scottsville Road, Rochester 11, N. Y.
Waxing & Oiling, Carbon, Laboratory, Flat Room Converting and Measuring and Roadmarking.

MISCO "C"
THE CORROSION RESISTANT ALLOY
CAST • ROLLED • FABRICATED
for all equipment exposed to corrosion by sulphite acids
MICHIGAN STEEL CASTING CO., DETROIT 7, MICH.

Appleton Felts
APPLETON WOOLEN MILLS
APPLETON-WISCONSIN
PAPER

MILL AND MILL EQUIPMENT NUMBER

of

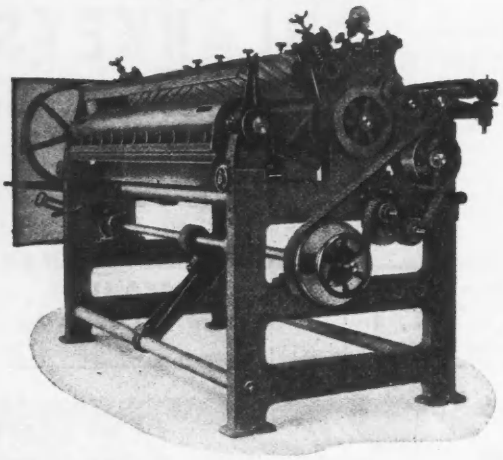
PAPER TRADE JOURNAL

will be

December 5, 1946

MODEL 28

ROLLER BEARING CUTTER



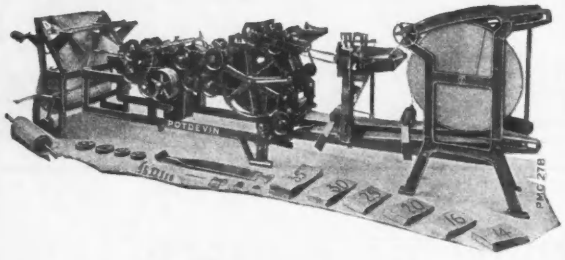
HAMBLET MACHINE CO.

LAWRENCE, MASS.

MAKERS OF
SINGLE, DUPLEX AND DIAGONAL PAPER CUTTERS
CUTTER KNIVES, PATENT TOP SLITTERS

POTDEVIN

GROCERY BAG MACHINE



SELF-OPENING-SQUARE

POTDEVIN Bag Machines are designed and manufactured to withstand long high speed runs and continuous, trouble-free operation.

50 YEARS of experience serving the Paper Converting Industry.

POTDEVIN MACHINE CO.
EST. 1893
1223 38TH ST. BROOKLYN, N.Y.

POTDEVIN

WHERE TO BUY

ABRASIVES
Monsanto Chemical Co.
Norton Co.
Raybestos-Manhattan Inc. Manhattan Rubber Division

ADHESIVES
American Anode Incorporated
American Resinous Chemicals Corp.
Arabol Mfg. Co.
Casein Company of America
Flintkote Company
Kelco Company
Monsanto Chemical Co.
National Adhesives Division of National Starch Products, Inc.
Philadelphia Quartz Co.
Stein, Hall & Co., Inc.
United States Rubber Co.

AGITATORS
Appleton Machine Co.
Biggs Boiler Works Co.
Dilts Machine Works, Inc.
Dorr Company
Downingtown Mfg. Co.
Hardinge Co., Inc.
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
D. J. Murray Mfg. Co.
Montague Machine Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Valley Iron Works Co.

AIR CONDITIONING
Spray Engrg. Company
Steamaire Company

ATOMIZERS
Steamaire Company

BAG MACHINES
Potdevin Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Weber, Herman G.

BALING MACHINES
Thomas W. Hall Co.

BARKERS AND CHIPPERS
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Carthage Machine Co.
Fibre Making Processes, Inc.
D. J. Murray Mfg. Co.
Valley Iron Works Co.

BARS
Dilts Machine Works, Inc.
E. D. Jones & Sons Co.
The Moore & White Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

BEARINGS
Black-Clawson Company
Jones, E. D., & Sons Co.
Magnus Metal Corp.
Montague Machine Works
Raybestos-Manhattan Inc. Manhattan Rubber Division
Rollway Bearing Co.
Shartle Brothers Machine Co.
SKF Industries, Inc.
Timken Roller Bearing Co.
Valley Iron Works Co.
T. B. Woods' Sons Company

BEATERS & JORDANS
The Appleton Machine Co.
Black-Clawson Company
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Hermann Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
J. J. Ross Company
Ross Paper Machy. Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works

BED PLATES
Bahr Brothers Mfg. Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

BELTING
Alexander Brothers
Allis-Chalmers Mfg. Co.
The Cincinnati Rubber Mfg. Co.
Raybestos-Manhattan Inc. Manhattan Rubber Division
J. E. Rhoads & Sons
United States Rubber Co.
T. B. Wood's Sons Company
Worthington Pump & Machy. Corp.

BLEACHING BOILERS, ROTARY
The Biggs Boiler Wks. Co.

BLEACHING APPARATUS
The Biggs Boiler Works Co.
Improved Paper Machy. Corp.
E. D. Jones & Sons Co.
Perkins & Sons, Inc., B. F.
Moore & White Co.
Niagara Alkali Co.
Noble & Wood Machine Co.
Pennsylvania Salt Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.

BLOW PIPES & PITS
Carthage Machine Co.
Montague Machine Co.
Moore & White Co.
Murray Mfg. Co., D. J.
Walworth Company

BOILERS
Babcock & Wilcox Co.
Biggs Boiler Works
Foster Wheeler Corp.

BOILERS (Electric)
Steamaire Company

BOTTOMS
Harrington & King Perforating Co.
Kalamazoo Tank & Silo Co.
Valley Iron Works Co.

CALENDERS
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
Lobdell Car Wheel Co.
Moore & White Co.
Perkins & Son, Inc., B. F.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works
Waldron Corp., John

CASEIN
Casein Company of America

CASTINGS
Appleton Machine Co.
Black-Clawson Company
Carthage Machine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Grinnell Company
Hamblet Machine Co.
Hardinge Co., Inc.
E. D. Jones & Sons Co.
Lobdell Car Wheel Co.
Magnus Metal Corp.
Montague Machine Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Union Machine Company
Union Screen Plate Co.
Valley Iron Works Co.

WHERE TO BUY

Walworth Company

CENTRIFUGAL MACHINERY
Bird Machine Co.
De Laval Steam Turbine Co.
Nichols Engrg. & Research Corp.
Ross, J. O., Eng. Co.
Shartle Brothers Machine Co.
Wilkins Apparatus Co.

CHEMICALS
American Anode, Incorporated
Amer. Cyanamid & Chem. Corp.
Amer. Resinous Chemicals Corp.
Ansul Chemical Co.
Calco Chemical Co.
The Cowles Detergent Co.
Diamond Alkali Co.
Dispersion Process, Inc.
Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
Falls Chemical Products Co.
General Dyestuff Corp.
Geigy Co., Inc.
Gottesman & Co.
Hooker Electrochemical Company
Kelco Company
Mallinckrodt Chemical Wks.
The Mathieson Alkali Works, Inc.
Monsanto Chemical Company
National Oil Products Co.
Naugatuck Chemical Div. of U. S. Rubber Co.
Niagara Alkali Company
Paper Makers Chemical Department, Hercules Powder Co.
Pennsylvania Salt Mfg. Co.
Philadelphia Quartz Co.
Pioneer Salt Company
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
United States Rubber Co.
Witco Chemical Co.
Wyandotte Chemicals Corp.

CLEANING MATERIALS
Adell Chemical Company
Amer. Cyanamid & Chem. Corp.
Bird Machine Co.
The Cowles Detergent Co.
E. I. du Pont de Nemours & Co., Inc.
Paper Makers Chemical Department, Hercules Powder Co.
Magnus Chemical Co.
Monsanto Chemical Co.
Nichols Engrg. & Research Corp.
Oakite Products, Inc.
Pennsylvania Salt Mfg. Co.
Philadelphia Quartz Co.
Pittsburgh Plate Glass Co., Columbia Chemical Division
Solvay Sales Corp.
Wyandotte Chemicals Corp., J. B. Ford Division

CLUTCHES
Appleton Machine Co.
Black-Clawson Company
Hudson Sharp Machine Company
Farrel-Birmingham Co.
Fawick Airflex Co., Inc.
Hardinge Co., Inc.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Wks.
Stearns Magnetic Mfg. Co.
T. B. Wood's Sons Company

COATING MACHINERY
Hudson Sharp Machine Company
Mayer Machine Co.
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
South Wabash Engrg. Co.
Waldron Corporation, John
Weber, Herman G.

COCKS, LUBRICATED PLUGS
American Car & Foundry Co.

COMPRESSORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
Ingersoll-Rand Co.
Nash Engineering Co.
Worthington Pump & Machy. Corp.

CONDENSERS
Foster Wheeler Corp.

CONSULTING ENGINEERS
Frederic C. Clark
Ferguson, Hardy S.
Hardy, George F.
Alvin H. Johnson & Co., Inc.
The Kohler System Company
Main, Inc., Chas. T.
The McPherson Company
Roderick O'Donaghue
The Rust Engrg. Co.
J. E. Sirrine & Co.
South Wabash Engrg. Co.
Stone & Webster Engrg. Corp.

CONTROLLERS
Black-Clawson Co.
Cochrane Corp.

CONTROLS
The Bristol Company
Cochrane Corp.
Stickle Steam Specialties Co.

CONVEYORS
Black-Clawson Company
Murray, D. J., Mfg. Co.
Ross Engineering Corp., J. O.

COOLING SYSTEMS
Foster Wheeler Corp.
Steamaire Company

CORES
Elfman Paper Co.
Rodney Hunt Machine Co.
Montague Machine Co.
Smith & Winchester Mfg. Co.
Sonoco Products Co.
Walker-Goulard-Plehn Co.

COUPLINGS
Black-Clawson Company
De Laval Steam Turbine Co.
Farrel-Birmingham Co., Inc.
Hardinge Co., Inc.
E. D. Jones & Sons Co.
Lovejoy Flexible Coupling Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Valley Iron Works
Waldron Corp., John
Westinghouse Electric Corporation
T. B. Wood's Sons Company

CRANES
Northwest Engrg. Co.
Reading Chain & Block Company

CRUSHERS
Fibre Making Processes, Inc.

CUTTERS
Dilts Machine Works
Thomas W. Hall Co.
Noble & Wood Machine Co.
Perkins & Son, Inc., B. F.
The Smith & Winchester Mfg. Co.
South Wabash Engrg. Co.
Taylor Stiles & Co.

DAMPENERS
Perkins & Son, Inc., B. F.
Steamaire Company
Valley Iron Works Co.

DE-INKING
Adell Chemical Company
Dilts Machine Works
Hardinge Co., Inc.
Kinsley Chemical Co.
Shartle Bros. Mach. Co.

DIGESTERS
Biggs Boiler Works Co.
Foster Wheeler Corp.
Pusey & Jones Corp.

DOCTORS
Bird Machine Company
Black-Clawson Company
Downingtown Mfg. Co.
Lobdell Co.
Lodding Engineering Corp.
Montague Machine Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.

DOCTOR BLADES
Black-Clawson Company
Lodding Engrg. Corp.
Montague Machine Co.
Raybestos-Manhattan Inc. Manhattan Rubber Division
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers
United States Rubber Co.
Westinghouse Electric Corporation

DRIERS
Black-Clawson Company
Murray Mfg. Co., D. J.

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The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Valley Iron Works Co.

DRIVES
Allis-Chalmers Mfg. Co.
Appleton Machine Co.
Bird Machine Co.
Black-Clawson Company
Davis, Frank H., Co.
De Laval Steam Turbine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
General Electric Company
Rodney Hunt Machine Co.
Montague Machine Co.
Moore & White Co.
Murray, D. J., Mfg. Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Wks
Shartle Brothers Machine Co.
T. B. Wood's Sons Co.
Valley Iron Works Co.
Westinghouse Electric Corporation

DRUMS
Fibre Making Processes, Inc.

DRYER DRAINAGE
Stickle Steam Specialties Co.

DUSTERS
Appleton Machine Co.
Downingtown Mfg. Co.
Fibre Making Processes, Inc.
E. D. Jones & Son Co.
Moore & White Co.
Noble & Wood Machine Co.
Norwood Engrg. Co.
D. J. Murray Mfg. Co.

DYESTUFFS
Calco Chemical Co.
Ciba Company
E. I. du Pont de Nemours & Co., Inc.
Geigy Co., The
General Dyestuff Corp.
National Aniline Division, Allied Chemical & Dye Corp.
Paper Makers Chemical Department, Hercules Powder Co.
C. K. Williams & Co.
Witco Chemical Co.

EMBOSSING ROLLS
Northern Engraving & Mch. Co.
Roehlen Engraving Works

EVAPORATORS
Black-Clawson Company
Foster Wheeler Corp.
Goslin-Birmingham Mfg. Co., Inc.
Murray, D. J., Mfg. Co.
Swenson Evaporator Co., Div. of Whiting Corp.

FANS
General Electric Co.
B. F. Perkins & Son, Inc.
Ross Engineering Co., J. O.

FEEDERS
Fibre Making Processes, Inc.
Hardinge Co., Inc.
Merrick Scale Mfg. Co.
Leeds & Northrup
Wallace & Tiernan

FELTS
Appleton Woolen Mills
Asten-Hill Mfg. Co.
Bloomfield Woolen Co.
Bulkley, Dunton Pulp Co., Inc.
Draper Bros. Corp.
Huyck & Son, F. C.
Lockport Felt Co.
Mt. Vernon-Woodbury Mills, Inc.
Morey Paper Mill Supply Co.
Orr Felt & Blanket Co.
Shuler & Benninghofen
Waterbury Felt Co.
Waterbury, H., & Sons Co.

FELT CONDITIONERS
Steamaire Company

FELT GUIDES
Moore & White Co.
The Sandy Hill Iron & Brass Wks
Shartle Brothers Machine Co.
Waldron Corp., John

FILLERS
Aluminum Flake Co.
American Colloid Co.
Amer. Cyanamid & Chem. Corp.
Amer. Resinous Chemicals Corp
Johns-Manville Sales Corp.
W. H. Loomis Talc Corp.
Vanderbilt Co., R. T.
Witco Chemical Co.

FILTERS
Cochrane Corp.
Hardinge Co., Inc.
Moore & White Co.
J. O. Ross Engrg. Corp.
Witco Chemical Co.
Worthington Pump & Machy. Corp.

FLOORING, GRATING & TREADS
Hendrick Mfg. Co.
Klemp Co., W. F.
Norton Co.
Raybestos-Manhattan Inc.
Manhattan Rubber Division
United States Rubber Co.

FORMING MACHINES
Downingtown Mfg. Co.
Noble & Wood Machine Co.
Oliver United Filters
The Sandy Hill Iron & Brass Wks
Shartle Brothers Machine Co.
South Wabash Engrg. Co.

FRICTION MATERIALS
Johns-Manville Sales Corp.

FREENESS TESTERS
Testing Machines, Inc.
Williams Apparatus Co.

GEARS
Black-Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Wks
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

GRINDERS
Carthage Machine Co.
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Montague Machine Co.
Norton Company
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Wks

GRINDING WHEELS
The Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
Norton Company
United States Rubber Co.

HEAT EXCHANGERS
Foster Wheeler Corp.
Stickle Steam Specialties Co.

HEAT RECOVERY SYSTEMS
Foster Wheeler Corp.
Stickle Steam Specialties Co.

HEATING, VENTILATING AND AIR CONDITIONING
The Appleton Machine Co.
Armstrong Machine Works
Cochrane Corp.
E. D. Jones & Sons Co.
General Electric Co.
Grinnell Company
Leeds & Northrup
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Ross Engineering Corp., J. O.
Shartle Brothers Machine Co.
Stickle Steam Specialties Co.
Valley Iron Works Co.
Worthington Pump & Machy. Corp.

HOISTS
Appleton Machine Co.
Dilts Machine Works
Rodney Hunt Machine Co.
Ingersoll-Rand Co.
E. D. Jones & Sons Co.
Reading Chain & Block Corp.

HOSE (Air, Water, Suction, etc.)
The Cincinnati Rubber Mfg. Co.
Raybestos-Manhattan Inc.
Manhattan Rubber Division
United States Rubber Co.

HUMIDITY CONTROL
Spray Engrg. Company
Steamaire Company

HYDRAPULPERS
Ross Paper Machy. Co.

INSTRUMENTS, TESTING AND MEASURING
Bauer Brothers Co.
N. P. Bowsher
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Cochrane Corp.
The Foxboro Company
General Electric Company
W. & L. B. Gurley
Leeds & Northrup Company
National Technical Laboratories
B. F. Perkins & Son
Taber Instrument Corp.
Taylor Instrument Cos.
Testing Machines, Inc.
Wallace & Tiernan Instrument Co.
Williams Apparatus Co.

WHERE TO BUY

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Johns-Manville Sales Corp.

JOINTS
Perfecting Service Company

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Bahr Brothers Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

KNIVES
Black-Clawson Company
Dilts Machine Works, Inc.
Hamblet Machine Co.
E. D. Jones & Sons Co.
Valley Iron Works Co.

KNOTTERS
Fibre Making Processes, Inc.

LABORATORY EQUIPMENT
Appleton Machine Co.
Bauer Brothers Co.
The Biggs Boiler Works Co.
W. H. & L. D. Betz
Dilts Machine Works
E. D. Jones & Sons Co.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Taber Instrument Co.
Taylor Instrument Companies
Testing Machines, Inc.
Valley Iron Works
Williams Apparatus Co.

LAY BOYS
Hamblet Machine Co.
Moore & White Co.
Shartle Brothers

LINTER COTTON
The Railway Supply & Mfg. Co.

LUBRICANTS
Gulf Oil Corporation
Gulf Refining Co.
Sinclair Refining Co.
Socony-Vacuum Oil Co., Inc.
Sun Oil Company
The Texas Company
Tide Water Associated Oil Co.

LUBRICATORS
Hills-McCanna Co.

MATERIAL HANDLING
Automatic Transportation Co.
Brooks Equipt. & Mfg. Co.
Northwest Engrg. Co.
Reading Chain & Block Company

MICROMETERS & CALIPERS
Farrel-Birmingham Co.
Montague Machine Co.
Lobdell Car Wheel Co.
Testing Machines, Inc.
Walker-Goulard-Plehn Co.

MOISTENING EQUIPMENT
The Spray Engineering Co.
Steamaire Company

MOISTURE CONTENT CONTROL
Spray Engrg. Company
Steamaire Company
Stickle Steam Specialties Co.
Williams Apparatus Co.

MOTORS AND GENERATORS
Allis-Chalmers Mfg. Co.
Continental Electric Co.
De Laval Steam Turbine Co.
General Electric Co.
Ingersoll-Rand Co.
Reliance Electric & Engrg. Co.
Westinghouse Electric Corporation

NOZZLES
Spray Engrg. Company
Steamaire Company

PACKING BOXES
Johnson Corporation
Shartle Brothers Machine Co.

PACKING
Johns-Manville Sales Corp.
The Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
United States Rubber Co.

PAPER MACHINES
Bagley & Sewall Co.
Black-Clawson Company
Downingtown Mfg. Co.
Thomas W. Hall Co.
Moore & White Co.
Pusey & Jones
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

PAPER MACHINE SLICES
Black-Clawson Company
E. D. Jones & Sons Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Wks.
Valley Iron Works Co.

PAPER MILL BUILDERS
Merritt-Chapman & Scott Corp.
The Rust Engrg. Co.

PAPER TUBE MACHINERY
Theo. Adams
Dietz Machine Works
Thomas W. Hall Co.
Hudson Sharp Machine Company
Langston Co., Samuel M.
South Wabash Engrg. Co.

PASTING MACHINES
Black-Clawson Company
Davis, Frank H., Co.
Murray, D. J., Mfg. Co.
Moore & White Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
South Wabash Engrg. Co.
Waldron Corp., John

PENSTOCKS, WELDED STEEL
The Biggs Boiler Works Co.

PERFORATED METAL
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Harrington & King Perforating Co.
Hendrick Mfg. Co.

PIPE
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Crane Company
Deublin Company
Grinnell Company
Johns-Manville Sales Corp.
Shartle Brothers Machine Co.
Stowe-Woodward, Inc.
Taylor Forge & Pipe Works
Walworth Company

PLATERS
Perkins & Son, Inc., B. F.

PLATES
Black-Clawson Company
Hendrick Mfg. Co.
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Timken Roller Bearing Co.

PLATE WORK (Steel & Alloy)
The Biggs Boiler Works Co.

PLUGS
Black-Clawson Company
E. D. Jones & Sons Co.
The Noble & Wood Machine Co.
Shartle Brothers Machine Co.

PRESSURE VESSELS, STEEL AND ALLOY
The Biggs Boiler Works Co.
Foster Wheeler Corp.

PRESSES
Black-Clawson Company
Dietz Machine Works
Farrel-Birmingham Co.
Fibre Making Processes, Inc.
Thomas W. Hall Co.
Hudson-Sharp Machine Co.
Paper Converting Machine Co., Inc.
Potdevin Machine Co.
Rotogravure Engineering Co.
Shartle Brothers
South Wabash Engrg. Co.
Valley Iron Works Co.
Waldron Corp., John
Weber, Herman G.
Williams Apparatus Co.

PULPERS
Bauer Brothers Co.

PULPS
Andersen Co., J.
Bulkley, Dunton Pulp Co., Inc.
Gottesman & Co., Inc.
Elof Hansson, Inc.
Lyddon & Co. (America) Inc.
Parsons & Whittemore, Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.

PULPSTONES
Norton Company

PUMPS
Allis-Chalmers Mfg. Co.
Black-Clawson Company
Buffalo Pumps, Inc.
Dorr Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Hardinge Co., Inc.
Hills-McCanna Co.
Ingersoll-Rand Co.
Johnson Corp.
Moore & White Co.
Morris Machine Works
Nash Engineering Co.
Noble & Wood Machine Co.
Paper Converting Mch. Co.
J. J. Ross Company
Ross Paper Machy. Co.
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Pusey & Jones
Ross Engineering Corp., J. O.
Valley Iron Works Co.
REELS
Black-Clawson Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Hudson Sharp Machine Company
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Rodney Hunt Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.
REFINERS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
Bauer Brothers Co.
Dilts Machine Works
The Hermann Manufacturing Co.
E. D. Jones & Sons Co.
Murray, D. J., Mfg. Co.
Noble & Wood Machine Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sprout, Waldron & Co.
Sutherland Refiner Corp.
Valley Iron Works
REGULATORS
Allis-Chalmers Mfg. Co.
Armstrong Machine Works
Bird Machine Company
The Bristol Company
The Brown Instrument Co.
Cochrane Corp.
The Foxboro Company
Jones, E. D., & Sons Co.
General Electric Co.
Johnson Corp.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Shartle Brothers
Stickle Steam Specialties Co.
Taylor Instrument Companies
Trimbey Mach. Wks.
Wallace & Tiernan
Westinghouse Electric Corporation
RESINS
Amer. Cyanamid & Chemical Corp.
Amer. Resinous Chemicals Corp.
Monsanto Chemical Co.
The Resinous Prod. & Chem. Co.
ROLLS
Appleton Machine Co.
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Improved Paper Machy. Corp.
Lobdell Co.
Montague Machine Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Perkins, B. F., & Sons Co.
Philbrick Engrg. & Machine Co.
Pusey & Jones Corp.
Raybestos-Manhattan Inc.
Manhattan Rubber Division
Roehlen Engraving Works
J. J. Ross Company
Ross Paper Machy. Co.
Rodney Hunt Machine Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Sinclair Co.
Smith & Winchester Mfg. Co.
Stearns Magnetic Mfg. Co.
Stowe-Woodward, Inc.
United States Rubber Co.
Valley Iron Works Co.
Waldron Corp., John
ROLL COVERS
The Cincinnati Rubber Mfg. Co.
Stowe-Woodward, Inc.
ROLL STANDS
Cameron Machine Co.
The Kohler System Company
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
South Wabash Engrg. Co.
ROOFING MATERIALS
Johns-Manville Sales Corp.
ROTARY BOILERS
Biggs Boiler Works
SATURATING MACHINES
Black-Clawson Company
Moore & White Co.
Noble & Wood Machine Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.
SAVEALLS
Bulkley, Dunton Pulp Co., Inc.
SCALES
Merrick Scale Mfg. Co.
SCREEN PLATES
Fitchburg Screen Plate Co.
Magnus Metal Corp.
Morey Paper Mill Supply Co.
Testing Machines, Inc.
Union Machine Co.
Union Screen Plate Co.
SCREENS
Allis-Chalmers Mfg. Co.
Appleton Wire Works
Appleton Machine Company
Bird Machine Company
Carthage Machine Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Harrington & King Perforating Co.
Hendrick Manufacturing Co.
E. D. Jones & Sons Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Trimbey Mach. Wks.
Valley Iron Works Co.
SHEET MACHINES
Thomas W. Hall Co.
The Hermann Manufacturing Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
Valley Iron Works Co.
Williams Apparatus Co.
SHOWER PIPES
Bird Machine Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
Moore & White Co.
Shartle Bros. Mach. Co.
Smith & Winchester Mfg. Co.
SHREDDERS
Bauer Brothers Co.
Carthage Machine Co.
SIZING
Amer. Cyanamid & Chemical Co.
Amer. Resinous Chemicals Corp.
Black-Clawson Company
The Dow Chemical Company
du Pont, E. I., de Nemours & Co.
Flintkote Company
Kelco Company
Monsanto Chemical Co.
National Oil Products Co.
Paper Makers Chemical Department, Hercules Powder Co.
Philadelphia Quartz Co.
Pioneer Salt Company
Socony-Vacuum Co.
Stein, Hall & Co., Inc.
SLIME CONTROL
Falls Chemical Products Co.
Magnus Chemical Co.
Mallinckrodt Chemical Wks.
SLITTERS
Theo. Adams
Black-Clawson Company
Cameron Machine Co.
Carthage Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co., Inc.
Hamblet Machine Co.
Hudson Sharp Machine Company
Langston Co., Samuel M.
Moore & White Co.
D. J. Murray Mfg. Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Wks.
Smith & Winchester Mfg. Co.
South Wabash Engrg. Co.
Valley Iron Works Co.
Waldron Corp., John
SMOKE STACKS
The Biggs Boiler Works Co.
SOLENOID VALVES
Steamaire Company
SPRAYING EQUIPMENT
The Spray Engineering Co.
Steamaire Company
STAINLESS STEEL
Anti-Corrosive Metal Products Co., Inc.
U. S. Steel Corp.
STARCH
Amer. Cyanamid & Chemical Corp.
Clinton Industries, Inc.
National Starch Products, Inc.
Stein, Hall & Co., Inc.
STATIC ELIMINATORS
Steamaire Company
STEAM SPECIALTIES
Babcock & Wilcox Co.

WHERE TO BUY

Cochrane Corp.
Johnson Corp.
Perfecting Service Company
Shartle Bros. Mch. Co.
Stickle Steam Specialties Co.

STEEL
American Rolling Mill Co.
Anti-Corrosive Metal Prod. Co.
Carnegie Illinois Steel Co.
U. S. Steel Corp.

STEEL TANKS
The Biggs Boiler Wks. Co.

STRAPPING & STRAPPING MACHINES
Acme Steel Company
The Stanley Works

STUFF CHESTS
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Valley Iron Works Co.

SUCTION BOXES
Black-Clawson Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Westinghouse Electric Corp.

SULPHUR
Amer. Cyanamid & Chemical Corp.
Stauffer Chemical Company
Texas Gulf Sulphur Co.
Witco Chemical Company

SULPHUR BURNERS
Valley Iron Works Co.

SULPHUR DIOXIDE
Ansul Chemical Company

SUPERCALENDERS
B. F. Perkins & Son, Inc.

TALC
Amer. Cyanamid & Chemical Corp.
W. H. Loomis Talc Corp.

TANKS
Cochrane Corp.
E. D. Jones & Sons Co.
Kalamazoo Tank & Silo Co.
The Noble & Wood Machine Co.
Raybestos-Manhattan Inc.
Manhattan Rubber Division
Rodney Hunt
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Stowe-Woodward, Inc.
United States Rubber Co.
Waldron Corp., John
B. F. Perkins & Son, Inc.
Testing Machines, Inc.

THICKENERS, DECKERS AND SAVEALLS
Bird Machine Company
Bulkley, Dunton Pulp Co., Inc.
Carthage Machine Co.
Dilts Machine Works
Dorr Co.
Downingtown Mfg. Co.
Hardinge Co., Inc.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Valley Iron Works Co.

TILE
Holyoke Drainer Tile Co.

TITANIUM
E. I. du Pont de Nemours & Co.
Titanium Pigment Co.
R. T. Vanderbilt Co.
Witco Chemical Company

TOOLS
Acme Steel Company
Ingersoll-Rand Co.
The Stanley Works
Walworth Company

TRUCKS
Automatic Transportation Co.

TRAPS
Armstrong Machine Works
Cochrane Corp.
Crane Co.
Grinnell Company.
Johnson Corporation
Shartle Bros. Mch. Co.
Stickle Steam Specialties Co.

TUBS
Rodney Hunt Machine Co.
Noble & Wood Machine Co.
Shartle Brothers
Valley Iron Works Co.

TURBINES
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Company
Hunt, Rodney, Mach. Co.
Westinghouse Electric Corp.
Worthington Pump & Machy. Corp.

TURPENTINE RECOVERY
Foster Wheeler Corp.

USED EQUIPMENT
Frank H. Davis Company
Gibbs-Brower Co.
Thomas W. Hall Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
Ross Paper Machy. Co.
Ross Paper Machinery Co.
Shartle Brothers Machine Co.

VALVES
The Bristol Company
Cochrane Corp.
Crane Company
Dilts Machine Works
Fibre Making Processes, Inc.
The Foxboro Company
E. D. Jones & Sons Co.
Magnus Metal Corp.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
The Permutit Company
William Powell Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Stickle Steam Specialties Co.
Taylor Instrument Companies
Trimbey Mach. Wks.
Valley Iron Works Co.
Walworth Company

VALVES, LUBRICATED PLUG
American Car & Foundry Co.

VATS & VAT PARTS
Union Machine Co.
Union Screen Plate Co.

WASHERS
Bird Machine Company
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Wks.
Rodney Hunt Machine Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

WATER CONDITIONING
Cochrane Corp.
The Permutit Company

WATER DISPERSIONS
American Anode, Inc.

WAXING MACHINERY
Black-Clawson Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

WELDING EQUIPMENT
Allis-Chalmers Mfg. Co.
General Electric Company
Walworth Company
Westinghouse Electric Corp.

WET MACHINES
Black-Clawson Co.
Carthage Machine Co.
Downingtown Mfg. Co.
Moore & White Co.
Montague Machine Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Wks.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

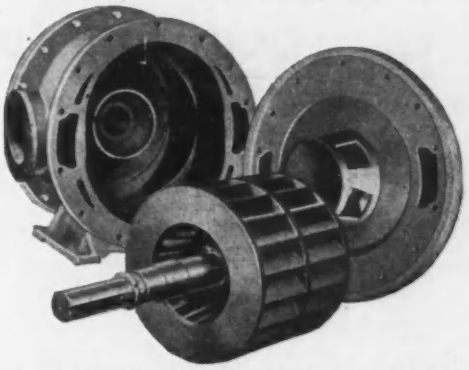
WINDERS AND REWINDERS
Black-Clawson Company
Cameron Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co.
Hudson-Sharp Mach. Co.
Langston Co., Samuel M.
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Potdevin Machine Co.
Pusey & Jones Corp.
Rotogravure Engrg. Co.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Wks.
Smith & Winchester Mfg. Co.
South Wabash Engrg. Co.
Waldron Corp., John

WIRES
Appleton Wire Works
Black-Clawson Company
Bulkley, Dunton Pulp Co., Inc.
Cheney Bigelow Wire Works
Hayden Wire Works
International Wire Works
Lindsay Wire Weaving Co.
Shartle Brothers Machine Co.

WOOD PEELERS
Nekoosa Fdy. & Mch. Wks., Inc.

WOOD SPLITTERS
Carthage Machine Co.

SIMPLICITY



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Operating advantages made possible by the Nash principle, and present in no other type of vacuum pump, permit a new level of operating economy. Nash Vacuum Pumps have but one moving part, a rotor cast in one piece, and revolving without metallic contact. There are no valves, no pistons or sliding vanes, no internal parts requiring wear adjustment or lubrication.

NASH ENGINEERING COMPANY
SOUTH NORWALK, CONNECTICUT, U. S. A.

PRICE & PIERCE, Ltd.

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for domestic and export

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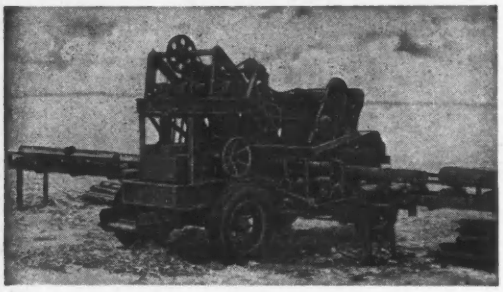
New York 17, N.Y.

The answer to your wood peeling problem

THE NEKOOSA PORTABLE WOOD PEELER



With it 10 men can do the work of 50.

You Are Sure

In these days of labor shortages it has been impossible for many mills to obtain enough peeled wood. Because of the increased production per man the Nekoosa Portable Wood Peeler has made it possible for many mills to obtain peeled wood, which otherwise would have had to handle it rough.

Thus this machine helps assure you of a supply of peeled wood, even though there is a shortage of woods labor.

Large Capacity
Low Cost Operation
No Wood Loss

Nekoosa Foundry & Machine Works Inc.

Nekoosa, Wis. **U. S. A.**

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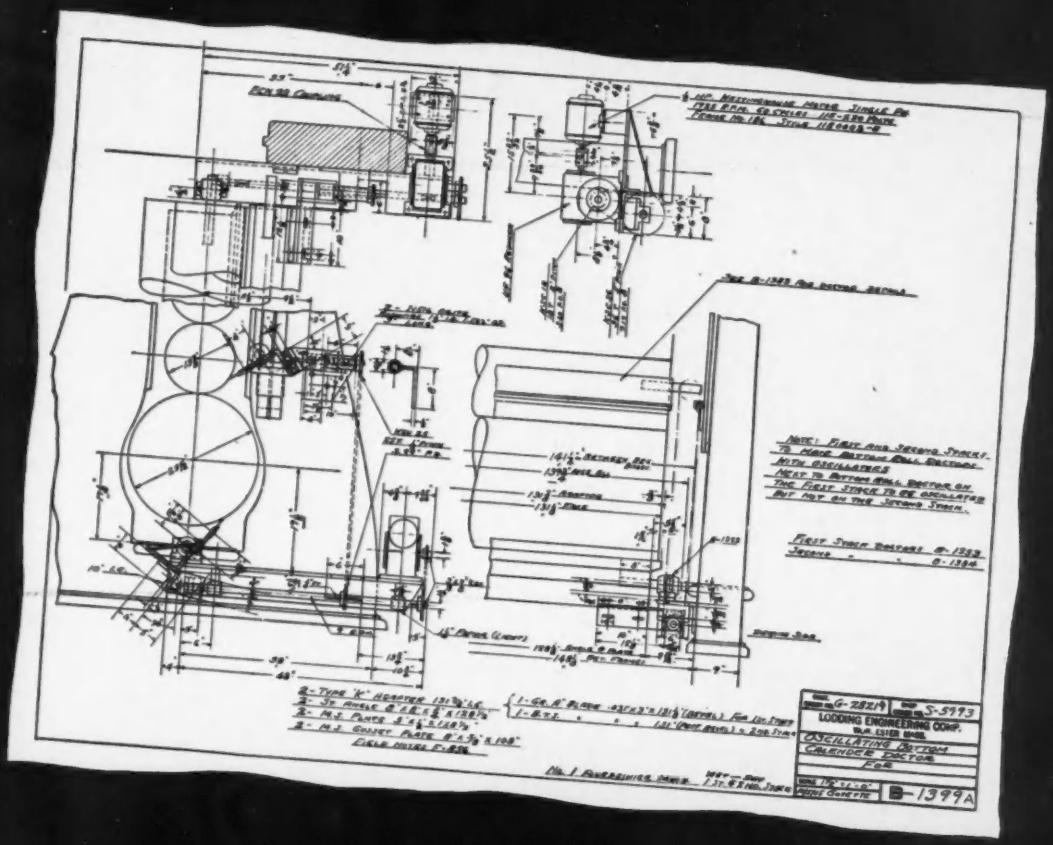

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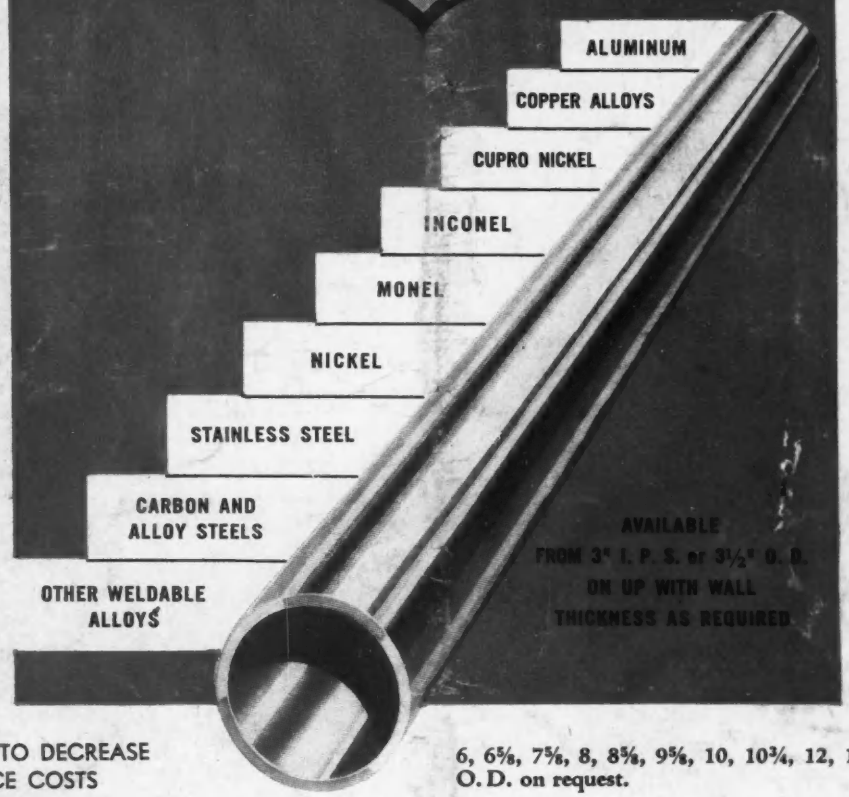
WELDCO
CORROSION RESISTING TUBING



USE ALLOYS TO DECREASE MAINTENANCE COSTS

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LENGTH . . . Standard length is 10 feet on wall thicknesses under 3/16"; 12 feet is standard for 3/16" and heavier.

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